Interlinkages of Years of Schooling, Health Status and Earnings

Evidence from Indian Households

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Preface

Education and health have been considered to be of crucial importance in initiating and sustaining the development process of a nation even as they influence the quality of life of the individuals in whom they are embodied. The attempt to explore the linkages between education, health and income has become all the more relevant with the introduction of the economic reforms. A number of questions plague us at this important juncture of Indian economic history. What is the impact of education at the level of the household? What is the impact of health on income? Does it vary across social and economic groups? What is the role of the state with respect to education and health? Is public spending effective? Where should it be directed to achieve maximum gains? In traversing the stormy sea of devising effective policies to bring about a simultaneous transition in income, health and education, within the context of the economic reforms programme, the answers to the above questions are likely to function as a lighthouse.

This monograph is an outcome of the study, "Micro Impacts of Macro and Adjustment Policies (MIMAP-India) in India", sponsored by the International Development Research Centre (IDRC), Ottawa. The data set that has been built up by the National Council of Applied Economic Research under the project has been utilised by this study to arrive at certain conclusions related to the problems mentioned above. The study quite clearly brings out the importance of education in increasing the income of the households and improving the health status of its members. It also reveals that level of education has a positive influence on household income and public spending that in turn has an impact on the level of education. Any increase in state domestic per capita income has a positive impact on private spending on education. Thus, state policies designed to have a positive impact on health and education are likely to, in turn, influence income as well as put greater pressure on the state to increase the quality and availability of services provided by it.

This is an opportune moment for me to thank the IDRC, especially Drs. Rohinton Medhora and Randy Spence, for sponsoring and funding the study. I may also express due appreciation for the effort put in by the members of the study team, especially Professor Ashok Mathur of the Jawaharlal Nehru University, New Delhi, for successfully completing this study.

Director General

Contents

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I. Introduction

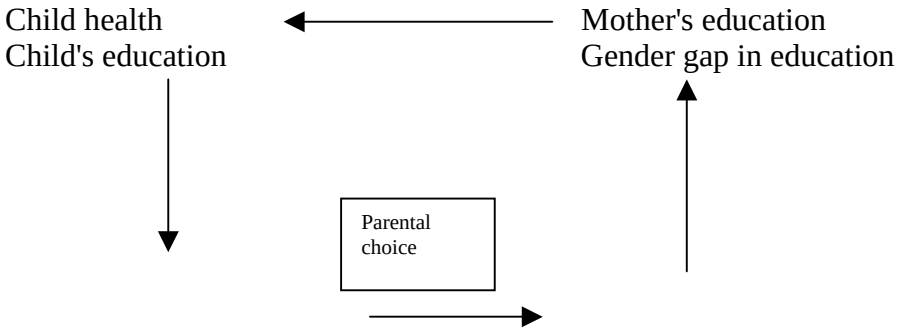
While Adam Smith's observations on education were guided by the objective of laying a basis for an orderly civil government and progress in economic activity apart from its moral and religious implications, Ricardo and Malthus were primarily concerned with education's role in inculcating prudential habits that would limit the family size along with promoting civil liberty. Alfred Marshall referred to "education as a national investment" (Marshall, 1890: 217), an important means for increasing the material wealth as also of sorting out the geniuses who were, according to Galton, getting seriously outnumbered because of racial degeneracy. Marx was convinced that general education would not evolve in a capitalist society because the inherent logic of a system where accumulation is the "Moses and the prophets" is such that it degrades the very labour whose skill provides the surplus. In a socialist society, the function of education would be to overcome this alienation of the worker from the means of production.

Keynes was influenced by the concept of national output propounded by Marshall and Pigou that differentiated between investment and consumption based on who made the decision to purchase. Thus, education was treated as consumption which logically inhibited any debate on the contribution of education to economic growth. Whatever be the philosophical position of the economists, the valuation of subjective satisfaction or dissatisfaction derived from education does not require a belief in the existentialist passion for life. The welfare approach to education emphasises the consumption aspect of education, literacy rate being treated as one of the components of human development index of a country. With the work of Schultz (1961), the investment approach to education gained currency. The instrumental role of education in achieving economic development is now widely acknowledged. With advancing technology, it is felt that human capabilities have to keep pace with changes in physical capital.

The instrumental role of education extends to income, health and demographic profile of the society, and these variables in turn affect the educational status of the society. The

process works both at the level of the individual and of the society. Production function analyses show that average educational attainment has a positive effect on economic growth. In agriculture, primary schooling increases productivity, speeds up the adoption of new technology and accelerates growth where there are new opportunities (Chaudhri, 1979). There are externalities associated with education, i.e., those who have had no education also tend to benefit from a generally higher level of educational attainment in the society as a whole. The level of education in a society has also been found to be positively correlated to decline in fertility, improved child health, reduced infant mortality, and greater social and gender equity (World Bank, 1997). This has wide-ranging implications for developing countries. Education then does not remain only as an 'end' of development process but also becomes a 'means' for achieving it. A decline in population growth rate can itself help these countries break out of a low-level equilibrium trap. Child health is a very important factor in deciding the kind of human capital that a country inherits, and education, particularly of the mother, is an important determinant of child health.

Fig. 1: Linkage between Education and Development



The linkage between education and development that has been presented (Figure 1) implies a shift away from looking at labour as a capacity to do manual work towards a view of human agent who is both a consumer and a producer, and as the latter, is not only differently endowed with capabilities but can also work towards enhancing it. Education and health tend to determine this capability although they are not all; many other factors like climate, natural ability, sex, family, discipline, motivation, organisation and urgency come into the picture. Considerations like these have led some economists to express doubts and scepticism related to stretching the economics of education into the area of quantitative measurement of returns to education. They have argued that education does not result in higher productivity, the higher returns to education only reflect the "conspicuous consumption" of the highly educated, or education serves as a screening mechanism for separating the more clever and the more motivated. Theoretically, it has been difficult to

challenge these criticisms as labour income is not suitably disaggregated to calculate the income flow to "human capital" and rate of return analysis simply assumes rather than demonstrates a rate of return. However, the basic tenets of human capital theory remained unchallenged and received support from repeated empirical studies. During the eighties human development increasingly gained prominence among the developing countries as well as international agencies. Education, particularly mass primary education, has been projected as one of the vital ingredients in the success of South-East Asian economies.

The literature on the subject would be richer with more case studies on the subject, particularly in exploring the linkage between, (a) education and income, and (b) education and health. Such a study would be of great value to the planners in bringing about educational change. Certain basic minimum level of income and health, it can be argued, are necessary for gaining education; on the other hand, education itself is one of the determinants of income and health. So, what may be required is a transformation in all the three together, one helping the other in breaking out of the vicious circle.

A cross-national comparison of educational attainments with per capita income by Bowman and Anderson (1963) presented two important conclusions: firstly, that a threshold level of adult literacy rate of 40% was a necessary though not a sufficient condition for attainment in 1950 of per capita incomes above US $ 200; and, secondly, that it was fruitless to try to sort out causality in this process. In contrast to England, education has led to economic development in Japan. More recently, Lau et al (1993) attributed nearly a quarter of Brazil's economic growth during the 1970's to the increase in the average education of the workforce. Mathur (1993) also found a positive association between stocks of human capital and economic development that was stronger at increasingly higher levels of education. The developing countries were acutely aware of the difference between them and the developed countries in terms of the educational achievements at the time that most of the developing countries achieved independence. There was an explosion of education in the Third World countries in a 30 year period between 1950 and 1980 (Table 1), considerably narrowing the gap between them and the developed countries during this period (Patel, 1985). The most impressive increase in enrolment was in higher education where the numbers increased by almost 18 times between 1950 and 1981, growing from less than a million to 18 million at 19.8 per cent per year.

Table 1: Growth in Enrolment by Region			
Region	Total Enrolment (in millions)		Annual Growth (per cent)
	1950	1981	
Developed Countries	148	237	1.6
Third World	90-100	627	6.3
World	250	865	4.1
Source: Patel (1985).			

In terms of historical dimension, India's educational system can be classified into the ancient and the modified indigenous system, the formal educational system as established under the British rule and the educational system which evolved during the post-independence period. Statistical evidence in detail is available only for the last two periods. While the scope of the present study does not include such a broad time frame, a brief background is appropriate at this stage to understand the reasons for educational change in India and the causes responsible for its limited degree of success.

The British introduced the formal system of education in order to create a class of people who would be loyal to "the Raj" and would act as intermediary between the British and the common masses. The high opportunity cost of entering into the fee-based formal educational system kept the socially and educationally disadvantaged sections from entering into it. Though mass education was increasingly stressed from 1921 onwards and the Sargent Plan of 1944 put emphasis on it, illiteracy levels continued to remain high.

After independence, the political leadership in India sought to make mass education a basis of the national reconstruction, the aim being a carry over from the objectives of the struggle for independence. Education would not only serve as a vehicle for economic independence of the individual but would be a harbinger of social change assuming special role in breaking economic and caste barriers. The Directive Principles of the Indian Constitution enshrined the objectives of free compulsory education for all children till the age of 14 and protective discrimination in favour of the weaker sections of the population. There has been an improvement in literacy rates as well as other indicators of human development over time but in comparison to some of the other Asian economies like that of South Korea, Sri Lanka and China it fades into insignificance.

Table 2: Literacy Rate of Persons Aged 7 and Above in India					
Year	1951	1961	1971	1981	1991
Literacy rate (per cent)	18.33	28.31	34.45	43.67	52.2
Source: Govt. of India (2000).					

As can be seen from Table 2, literacy rate increased from 18.3 per cent in 1951 to 52.2 per cent in 1991. The goal of free and compulsory elementary education, mentioned in the Directive Principles of the Indian Constitution, still remains a distant dream. The Gross Enrolment Ratio in the primary stage (Class I - V) increased from 42.6 per cent in 1950-51 to 92.14 per cent in 1998-99 and in the middle stage (Class VI - VIII) from 12.7 per cent to 56.8 per cent over the same period (Govt. of India, 2000, 171). A comparison of human development indicators with that of some Asian countries makes the disappointment much greater (Table 3). Even within India the experience has differed across states with Kerala doing much better than the average; in fact, Kerala's figures are comparable to that of the best performers among the Asian countries.

Table 3: Indicators of Human Development, 1997

Country	Life Expectancy at Birth (Years)	Infant Mortality Rate (Per thousand live births)	Adult Literacy Rate (per cent)
India	62.4	71	62
Kerala	72.0	12	93
China	69.8	38	83
Korea	72.4	6	97
Thailand	68.8	31	95

Source: Govt. of India (2000).

It is increasingly felt that widespread education and health at a certain threshold level may be the basis of sustained development. The experience of the South-East Asian economies suggests that subsidies for human capital accumulation may be a necessary condition for rapid development as individuals are not able to take into account the externalities associated with it (Tallman and Wang, 1992). It is a prerequisite not only for absorption but also for development of technology. This has wide ranging implications for the Indian case to which we may now turn our attention. Thus, the present monograph is an attempt to analyse the triangular relationship between education, health and household earnings based on the cross-tabulation of the data obtained through MIMAP-India survey (1996) of 3400 rural and 1600 urban households conducted by the NCAER.

The Plan of the rest of the report is as follows. Section II presents a brief outline of data and methodology to facilitate the understanding of concepts and issues presented in the rest of the monograph. Section III analyses two-way relationship between education and income. Section IV looks at the effect of education on the health status of the members of household. Section V deals with the interrelationship between health and education. In

Section VI macro level variables related to education are brought in to determine their impact on household behaviour. Section VII presents the regression results at the all India level as well as at the regional level. Section VIII presents a summary of major findings.

II. Data and Methodology

This section makes an attempt to explain the methodological issues involved in the survey. The concepts and the indicators have been defined to facilitate analysis of data in the subsequent sections.

It is widely accepted that, in any income-expenditure survey, there would be an inherent understatement of income. The people tend to suppress their income, particularly when questions relating to its disposition are not asked. To counter this hindrance for proper estimation of income, a cash flow statement at the household level was prepared in the MIMAP survey to check whether cash inflows during the year compare with cash outflows. Similarly, details of all sources of funds and their uses were also prepared at the household level to check inconsistencies, if any, in the data in the field itself. It was decided to allow ± 5% differences between the sources and uses of funds due to the fact of memory lapses of the respondent. The questionnaire was re-canvassed where the difference exceeded this limit.

However, in spite of the second visit and canvassing, some of the respondents were unable to express the details of the sources of funds and their uses, especially where the respondents were illiterate or at the highest level of income. Such filled-in questionnaires were not used for tabulation for further analysis. Thus, the present survey differs from others in that it tried to crosscheck the gap between income and expenditure at the household level.

The NCAER has conducted, over the years, a number of surveys to estimate household income, savings and consumption both in rural and urban parts of the country through a three-stage stratified sampling design. These studies suggested that the major component of the sampling error was due to variations between the first stage units of selection of districts in rural areas and towns in urban areas. Sampling error due to variations between households within a village or a block was quite small. This suggests the possibility of a significant improvement in precision through an increase in the number of first and second stage units of selection without increasing the overall sample size. Keeping this in

view, it was decided to select larger share of first and second stage units for the MIMAP survey as compared to earlier surveys.

In India, according to 1991 Census, 25.7% of the population were found to be living in urban areas. The rural-urban break-ups of population would, therefore, suggest selection of 1285 urban and 3725 rural households for a sample size of 5,000 households. A more efficient way of allocation would, however, be on the basis of the relative variance of income in the two regions. Since an important component of the MIMAP survey was to estimate income distribution at rural, urban, and all-India levels, the experience from the earlier studies weighed in favour of an optimal allocation of the sample for rural and urban areas to be 3400 and 1600 households respectively.

In any large-scale survey where data are to be collected from a number of households, a few non-responses are inevitable either due to absence or non-cooperation of the respondents to give information. There are two possible ways of tackling the non-responses, viz. by substituting households with similar households in the sample or by increasing the initial sample size to provide for possible non-response. This is likely to ensure that the effective sample size would be around the required level. The second approach is adopted in this study. Based on the experience of earlier surveys where the non-responses ranged between 8 to 10%, a sample of 3666 rural and 1757 urban households was finally selected for the study. However, the study covers all the states and union territories of India, except Andaman and Nicobar Islands, Dadra Nagar Haveli, Jammu and Kashmir, Lakshadweeps, Minicoy Islands, and Mizoram.

Rural Areas: A three-stage sample design was adopted to select the households with the first and second stage units as districts and villages respectively. In each state, 50% of the districts covered by the HDI survey were selected for this study by adopting a systematic random sampling technique. For each selected district, a random sample of 4 villages was selected from among the villages selected for the HDI survey. From each selected village, roughly 50% of the households of the HDI survey were selected from each category (as defined by the HDI survey) of households with the condition that at least one household of each existing category is selected. Thus, 392 villages were selected for this study.

Urban Areas: In all, 53 towns were selected for this survey. These towns formed a sub-sample of the towns selected for the Market Information Survey of Households (MISH) study in 1993. The towns were selected in such a manner that at least one town is selected from each town-size category. All the 4 largest metropolitan cities, Bombay, Calcutta, Delhi and Madras, were selected for the survey.

The blocks were allocated to towns by giving higher sample for towns in higher-size category. The blocks from each town were selected randomly from the MISH blocks. For each selected block, the list of households was available by income class in the listing for the MISH study. The households were selected from each income category in such a way as to give a higher relative sampling fraction to higher income households (because of larger variation in higher income households). Nine households were selected from each block so as to achieve the required sample.

The effective number of households selected for the analysis were 3364 in rural and 1492 in urban areas. The rate of non-response was found to be 8.2% in rural and 15.1% in urban areas. The rate of non-response in an earlier survey of income and its disposition in 1976 was 6.6% in rural and 11.1% in urban areas. The higher non-response rate in the MIMAP survey was mainly due to the difficulty encountered in Karnataka in carrying out the field work.

Concepts and Definitions

Some of the concepts and indicators used in this study have been defined below.

Sampling Unit: The household unit of the study is defined as a composition of persons living in the same dwelling unit and sharing food from a common kitchen. The number of members in the household thus defined constitutes the household size.

Head of the Household: The person, male or female, who takes all major decisions related to the household activities, is recognised as the head of the household.

Reference Period: In view of the predominance of rural households in the country and agriculture being the dominant activity, the agriculture year, July, 1994 to June, 1995, is adopted as the accounting period for the study.

Household Income: Household income is defined as the sum of earnings of all members of the household from all sources during the reference period. The various sources of income of the household are categorised as, (i) self-employment in farming, (ii) self-employment in non-farming, (iii) salary, (iv) agriculture wages, (v) non-agriculture wages, and (vi) others.

Farming activity for the study covered cultivation, plantations, and other allied agricultural activities such as orchards, sericulture, forestry, bee-keeping, fishery, piggery, poultry and livestock. Income from self-employment in farming (agriculture and allied pursuits) is obtained by deducting all the paid-out operating expenses incurred by the household to obtain the gross receipts (total receipts or value of output including by-products) during the reference period from the gross receipts from agriculture, animal husbandry, poultry, bee-keeping, etc.

The value of the output from a crop is derived as follows. If a farmer has not sold any part of his output, the entire output is valued at the farm harvest prices. If a farmer has sold a part of his output, the actual value of the part sold plus the value of the output retained by him at farm harvest prices is taken as the total value of his agricultural produce.

In case of by-products, their value as indicated by the farmer has been estimated. From the gross receipts from agriculture thus obtained, operating expenses for the production of crops (e.g. cost of seeds, fertiliser, manure, hired labour, irrigation charges, marketing charges, land revenue, etc.) have been deducted. It may be relevant to note that imputed value of family labour employed in the production crops is neither treated as imputed income nor as part of the current operating expenses incurred by the farmer. Gross income from self-employment in farming is derived by adding the income from crops and other agricultural activities.

Non-farm activity comprised business/trade, crafts like blacksmith, goldsmith, weaving, and profession of doctors, lawyers, etc. Gross income under this category is

accounted separately for the purpose of analysis by deducting from the gross receipts any operating expenses incurred by them during the reference year.

Income from salaries received by the members of a household is separately analysed, if they are employed on a regular salary-payment basis during the reference period. It may be noted that the salary income includes the basic pay plus allowances, bonus, commission, other receipts and also employers contribution to the provident fund, if any.

Income from wages earned by members of a household working as agricultural and non-agricultural labourers includes both cash receipts as well as imputed value of the payments in kind (such as meal, crop produce, etc.) received during the period they worked as labourers.

All other sources of income like house rent, current transfers, etc., are put under `others' category. Net rental income from house is derived by deducting the current expenses incurred for maintenance of the residential building including house tax paid, if any, during the reference period from the gross rental income from the house. For owner occupied dwelling unit, imputed value of the rental income of the dwelling unit was used. Income received by the members of the household from sources such as interest, dividends, pensions and regular receipts is also included in the `others' category.

Gross Income: The algebraic sum of income from self-employment in farming (SEF), self-employment in non-farming (SENF), salaries, agricultural wages, non-agricultural wages and other sources received by all the members in a household is defined as the gross income of the household during the reference year.

Expenditure on health and education: Expenditure on health covers the amount spent on doctor's fees, purchase of medicines, hospital/nursing home charges, and transport expenses for visiting hospital/doctor, etc. Similarly, education expenditure incurred by the household includes school/college fees, books and stationery, uniform, hostel and mess charges, transport expenses, etc.

Average Year of Schooling: The highest grade completed by a person is taken to indicate the number of years of his/her schooling. However, no adjustments have been made for such

children who have discontinued schooling after having enrolled in an academic year and have re-enrolled in the next academic year in the same grade. To this extent, the mean year of schooling might be underestimated.

Student: Any person up to the age of 34 years and currently studying is considered as student. But the expenditure on education which is recorded for the last academic year includes the expenditure on education of a person, only if the person concerned was a student during that academic year.

Children Ever Born: The CEB is defined as the total number of children born to a ever married woman during her reproductive span of 15-49 years.

Prevalence of Illness: Any person who has suffered illness during last 30 days preceding the survey is defined as ill. It includes illness prevailed/prevailing any time during the period irrespective of when it occurred.

Education of the 5-35 year age group: This is the average years of schooling of members in the age group of 5-35 years.

Household size: This variable represents the average household size that was derived by Dividing the total number of persons in a particular category of households by the total number of households in that category.

Days Not Able to Work due to Illness: This variable relates to the average number of days for which the earning members of a household were not able to go to work due to illness. The values presented in the table take an average for all households in a particular category.

Morbidity per Household: This variable was created to measure the level of illness at the household level. It is the average number of days of illness of all household members in a month.

Child mortality per household: This is the difference between children ever born in a household and the children surviving in that household.

Female labour force participation rate per household: This variable was derived by dividing the number of working women in the 15+ age group in a household by the total number of women in the 15+ age group in that household.

III. Years of Schooling and Household Earnings

Returns to education may be monetary as well as non-monetary, private as well as social. If a person with higher education has higher earnings then it can be said that education provides private monetary gains. This along with externalities of a pecuniary nature such as gains to employers or society at large translates into social returns to education. One way of assessing the relationship of private monetary gains to education and the level of education is to undertake a simple correlation analysis of education and income.

We look at education of the household head as a determinant of household income. But, it is prudent to mention here that the data provide us total household income and not just that of individual earning members. So, education of the household head has been taken as representative of the education of the other earning members; as a proxy for all of them.

Taking all groups together it can be seen that income constantly increases with education of the head of the household; the relation is positive (Table 4). The average income of all the households is Rs. 35694. Where the head of the household has had more than 8 years of schooling the income level is higher than average. The education of the younger age group of 5-35 years also is positively correlated with the education of the head. The average family size, in general, declines with rising education of the head. Along with higher average family income, this decline in family size with increase in education of the head implies better standards of living for those with higher educational attainments for those with higher educational attainment.

Table 4: Education, Income and Household Size, All-India				
Education of Head of household (years of schooling)	Income per household (Rupees)	Education of 5-35 year age-group (average years of schooling)	Household Size (persons)	Income per member of the household (Rupees)
0	24183.41	2.55	5.55	4357.37
1-5	31124.65	4.64	5.7	5460.46
6-8	32505.73	5.03	5.62	5783.94
9-10	43721.77	6.57	5.39	8111.65
11-12	52197.46	7.41	5.19	10057.31
>13	78611.29	9.37	4.97	15817.16
Total	35694.24	4.61	5.49	6501.68

Rural vis-à-vis Urban Households

The relation between education of the head and the household income is positive in rural areas also (Table 5). However, the households reach above average income as soon as education level is higher than zero. More than half the households in rural areas have heads with zero years of schooling. But, nearly half of the households for the whole of India, where the average income fell above eight years of schooling, also have heads with zero years of schooling. That the average falls within the first and the second educational categories in rural areas, where the dominant source of income is agriculture, implies that education has a positive effect on agricultural productivity. However, only a guarded conclusion can be presented here because it may only reflect a historical accident of households having greater assets going in for greater education and as such earning higher incomes even now. The average level of income is much smaller than that for All India average. It may be argued that an increase in the level of education in rural areas is likely to increase the level of income in rural areas. The education of the younger age group is also positively related with that of the head.

Table 5: Education, Income and Household Size, Rural-India				
Education of Head of household (years of schooling)	Income per Household (Rupees)	Education of 5-35 year age-group (average years of schooling)	Household Size (persons)	Income per member of the household (Rupees)
0	22838.64	2.43	5.55	4115.07
1-5	28394.29	4.43	5.74	4946.74
6-8	29660.92	4.84	5.81	5105.15
9-10	35714.73	5.87	5.66	6310.02
11-12	40184.61	5.85	5.5	7306.29
>13	46394.7	8.06	5.75	8068.64
Total	27411.2	3.79	5.64	4860.14

The family size, on the other hand, does not show a straightforward relationship with the education of the head of the household. Initially, it increases up to the level of 6-8 years of schooling of the head, declines for the next two levels of education and then increases again for more than 13 years of education of the head. There is a preference for bigger family size in rural areas due to a variety of reasons like labour-intensive nature of work with high seasonal variation in demand for labour and as a security for old age. The income effect of education is such as to make a larger family size affordable and maintainable. There is, on the other hand, a substitution effect of education, where quality is preferred over quantity that results in smaller family size. Initially, it may be argued, the income effect dominates, by reducing mortality and morbidity as well as increasing the resources available for managing a larger family. The substitution effect tends to take over above 8 years of schooling as a need is felt to ensure better quality of life with limited resources. Beyond 13 years of schooling the resources may be sufficient to ensure a higher standard of living even with bigger family size and so the income effect again predominates. The income per member of the household shows a continuous increase with the rise in the education of the head.

In urban areas too the relation between income and education appears to be positive with the exception of households where the head has had 6-8 years of schooling (Table 6). The income level goes above average only for households where the head has more than 10 years of schooling. The average income is more than twice the average for rural areas. This suggests that there are greater returns to education in urban areas than in rural areas. This might be the reason why average education is higher in urban areas. The average education of the younger age group increases with that of the household head. The average education of

this age group in urban areas is almost twice that of rural areas. In fact, for each level of the education of the head, the educational level of the 5-35 year age group is much higher in urban areas. This could be due to the realisation that higher education implies higher income in future. Also there could be externalities associated with education; a generally higher educational level of the society results in increased demand for education at the household level. It may also be a fact that the employers in urban areas show a preference for more educated employees. This could be a reason why the families demand more education for the younger age-group in the urban areas. So far as the family size is concerned, we find a decline in it by education of the head. Thus, the income effect of education never seems to predominate. In fact, for each level of education of head, we find a lower family size in urban areas than in rural areas. This may be related to Caldwell's argument about fertility decline, viz. rather than successive levels of education a generally higher educational level of the community is more important (World Bank, 1997: 41; Caldwell, 1980). While in rural areas nearly 53 percent of the households had heads with no education, in urban areas only around 10 percent of the households had heads with no education. Thus, there are externalities associated with education that may influence the family size. In urban areas, higher education and income tend to be coupled with smaller family size, implying greater economic well being for the individual. This conclusion is supported by the fact that the income per member of the household is substantially higher in urban areas. *There is thus a substantial difference between the relationship of the level of education and income to family size in the rural and in the urban areas.*

Table 6: Education, Income and Household Size, Urban-India

Education of Head of household (years of schooling)	Income per Household (Rupees)	Education of 5-35 years age-group (average years of schooling)	Household Size (persons)	Income per member of the household (Rupees)
0	35746.55	3.63	5.55	6440.82
1-5	42993.66	5.61	5.51	7802.84
6-8	41373.11	5.74	5.03	8225.27
9-10	53702.28	7.55	5.06	10613.10
11-12	61998.48	8.98	4.95	12524.95
>13	86306.51	9.8	4.79	18018.06
Total	57675.07	7.12	5.1	11308.84

Below and Above Poverty Line Households

In the case of households that are below poverty line (Table 7), no such clear association between education and income is visible. The implication seems to be that the transformation of education into higher income may be dependent upon the socio-economic background of the household, e.g. the perception of economic opportunities available may be dependent on the socio-economic background. However, again what is noteworthy is that for all households where the head has had some education the average income is higher than the average for all, except for households where the head has had 6-8 years of education in which case it is marginally lower than the overall average. It again does show that education makes a difference to the income level even if the returns are not very high. Even though the linkage between education and income is not very strong, the average educational level of the younger age group is higher where the head has had more education. This suggests that demand for education is not just based on the need for higher economic returns; education is valued on its own merit by the more educated.

In the case of households above poverty line (Table 8) again the association is positive. The average income of the households where the head has had more than 8 years of education is higher than the average for all households.

Table 7: Education, Income and Household Size, Below Poverty Group

Education of head of household (years of schooling)	Income per household (Rupees)	Education 5-35 years age-group (average years of schooling)	Household Size (persons)	Income per member of the household (Rupees)
0	16760.85	1.85	6.43	2606.66
1-5	20442.7	3.69	6.71	3046.60
6-8	18431.17	3.71	6.38	2888.90
9-10	23171.48	5.60	6.05	3830.00
11-12	21572.06	5.52	6.27	3440.52
>13	24317.98	6.18	6.62	3673.41
Total	18518.74	2.93	6.45	2871.12

Table 8: Education, Income and Household Size, Above Poverty Group				
Education of Head of household (years of schooling)	Income per household (Rupees)	Education of 5-35 years age-group (average years of schooling)	Household Size (persons)	Income per member of the household (Rupees)
0	29621.34	3.27	4.91	6032.86
1-5	37303.09	5.42	5.11	7300.02
6-8	38173.3	5.71	5.31	7188.95
9-10	48645.31	6.86	5.23	9301.21
11-12	56476.28	7.74	5.04	11205.61
>13	82513.8	9.73	4.85	17013.15
Total	43543.85	5.67	5.05	8622.54

Tables 7 and 8 suggest that transformation of education into higher private monetary gains is dependent on the economic status of the households. The increment in the average income of the households for each successive educational level of the head is much higher for the above poverty line households. This is observed much more clearly when we look at the income per member of the household. Thus, there may not be a direct link between education and employment for the below poverty line category of households. In the case of above poverty line households we find a kink at 6-8 years of schooling in the relationship between education and income per member of the household, whereas, in the case of below poverty line households the kink appears twice, one at 6-8 years of schooling and the other at 11-12 years of schooling. The above poverty line households show a much higher level of education of the younger age group than the below poverty line households. Parents are likely to send children to school if they perceive that the returns from education are higher than the expenses (Lockheed, et. al., 1991). Thus, a perception of better economic returns and a greater valuation of education due to a generally higher level of education in the immediate surrounding may explain the higher level of education in above poverty line households. The household size increases till 9-10 years of schooling of the household head and then declines, which is in keeping with our hypothesis of income and substitution effect of education on family size. However, it remains much smaller than the minimum for the BPL households that again could be due to the externalities associated with higher education in the social environment.

Salaried vis-à-vis Wage Earning Households

We have also considered here two occupational categories dependent on their labour as a source of income, namely, salaried persons and wage earners. For these two categories it may be said that health and education are two most important variables for income. The salaried households have a stable income while the wage earners tend to have a more unstable income.

In the case of salaried households (Table 9) the association between education of the head of the household and the household income is positive except for the households where the head has 6-8 years of education. The households having average income higher than the average for all households are those where the education of the head is more than 13 years. Almost a third of the salaried households had heads who had had more than 13 years of schooling. The sharp rise in income observed for this category suggests that income level of the households with higher than 13 years of education for the head jumps up substantially illustrating a high premium on higher education. Simultaneously the average size of the households is smallest for this category. The education of 5-35 year age group in general increases with education of the head except for those households where the head has had 6-8 years of education. The family size is highest for the households where the head has had 1-5 years of education despite the fact that the income level as well as the education level of 5-35 year age group for these households is higher than that of the households immediately preceding and succeeding it. It may be argued here that the income effect of education on family size predominates in the case of "low-educated low-income" households; a larger family may be seen as an asset, an idea reinforced by the fact that the educational level of the younger age group is high. For the lowest educational households economic factors are likely to predominate in deciding family size rather than a preference for smaller family while for higher educated households social factors that create a preference for smaller family size are likely to predominate.

Table 9: Education, Income and Household Size, Salaried Group				
Education of Head of household (years of schooling)	Income per household (Rupees)	Education of 5-35 years age-group (average years of schooling)	Household Size (persons)	Income per member of the household (Rupees)
0	41610.64	4.69	5.94	7005.16
1-5	44283.43	6.58	6.41	6908.49
6-8	42735.92	5.77	5.78	7393.76
9-10	49546.00	7.27	5.13	9658.09
11-12	53466.96	7.91	5.10	10483.72
>13	76317.68	9.60	4.83	15800.76
Total	54375.49	7.19	5.38	10106.97

In the case of wage earning households no clear association is found between education and income (Table 10). Here, all the households where the head has had some education have an income level higher then the average for all. The income levels and variations in them are similar to the below poverty line households. The income level is the highest for the category where the head has had 9 -10 years of education. The average education of the 5-35 year age group is also the highest for this category which may be explained by both, higher capacity to undertake expenditure on education as also greater expectations of returns from education. The family size tends to increase with education. These households do not seem to perceive a link between education and income, as suggested by the fact that the average education of 5-35 year age group for all wage-earning households is as low as 2.85 years, while it is 7.19 years for the salaried household. Also at each successive educational level of education of the head, the average educational level of the young is lower in the case of wage earners. Also the conclusion that education is valued on its own merit by the more educated is supported here; though the income level does not rise very substantially with education of the head, the average education of the younger age group does. In the case of wage-earning households we do not find the substitution effect of education coming into play in deciding family size. A bigger family may be seen as an increase in asset base that would have a positive effect on income of the household. But the income per member of the household starts declining beyond 9-10 years of schooling.

Table 10: Education, Income and Household Size, Wage Earning Group				
Education of Head of household (years of schooling)	Income per household (Rupees)	Education of 5-35 years age-group (average years of schooling)	Household Size (persons)	Income per member of the household (Rupees)
0	17673.08	1.97	5.29	3340.85
1-5	20065.00	3.80	5.54	3621.84
6-8	19200.71	4.07	5.13	3742.83
9-10	24787.61	5.33	5.71	4341.09
11-12	21951.30	5.13	5.85	3752.36
>13	22449.56	5.28	6.80	3301.41
Total	18816.67	2.85	5.36	3510.57

The salaried households, above poverty line households and the urban households show a substantial increment in income with the rise in education of the head of the household from 11 - 12 years to more than 13 years. On the other hand in the case of rural households, below poverty line households and the wage earners, no such distinct jump in the average level of income is found for similar difference in education of the head. This suggests that education may be a necessary condition for a rise in income but not a sufficient condition. *It may require sufficient opportunity for exploiting the potential created by it as well as a certain socio-economic background to be able to utilise those opportunities.* In rural areas, the average income level is Rs. 27411, less than half of the average income level in urban areas where it is Rs. 57675. This could be due to greater opportunities available in urban areas for utilising the educational potential. The average education of the 5-35 age group is again substantially higher in urban areas as compared to rural areas while the average size of the households is smaller.

A similar but much sharper difference is observed when (a) above poverty line households are compared to below poverty line households and (b) salaried households are compared to wage earners. This gives rise to the impression that a certain socio-economic background is necessary for education to act as a catalyst for higher income. It is also noticeable that for urban, above poverty line and salaried households, with increase in education of the head beyond 5 years of schooling there is a decline in household size; this along with the rise in income translates into a much higher per capita income. For the rural, below poverty line and wage earning households almost the reverse is observed. Thus, education and income have not been an instrumental cause for reduction in family size for

these households. *The household level data seems to reinforce the conclusion of studies at macro level that fertility decline may be linked more to the externalities related with education rather than merely being influenced by education within a household.*

The use of the education of the head of the household as a determinant of income has its limitations as the data provide to us the composite income of the household of all the income earners. However, since there appears to be no other meaningful way of associating household income to 'household education' the education of the head is taken here as a proxy. Such an analysis has another limitation that it does not take into account the experience of the earning members, which is another crucial variable in determining income.

Any analysis based on simple correlation does not determine the line of causality. Thus, from this it is difficult to say that higher education translates into higher income. It could also be, and perhaps is, that there is interdependence in both directions. Thus, income could itself be used as an independent variable to explain education. What we have in the data is the current income of the household. This cannot be used to explain the education of the head, which would have been completed in the past. However, the two together may be used to explain the education of the young members of the family. This is what we now attempt to do.

Table 11: Income as a determinant of education, All-India

Annual household Income Group (Rupees)	Education of Household head (years of schooling)	Education of 5-35 year age group (average years of schooling)	Household Size (persons)
Upto 1800	2.89	6.16	3.31
1801-3600	1.56	5.07	2.64
3601-7200	1.94	1.95	3.14
7201-14000	1.91	2.24	4.68
14001-28000	3.64	3.42	5.45
28001-56000	6.62	5.49	5.78
56001-72000	8.55	7.52	6.26
72001-96000	9.45	7.79	6.22
96001-150000	9.92	7.65	6.32
Above 150000	11.19	9.62	6.7
Total	5.05	4.61	5.49

For income level beyond the first (up to 1800), the education of the head, in general increases, and along with these does the average education of the 5-35 year age group (Table 11). Interestingly, the average household size increases with income. This is important because, keeping in mind the analysis based on education of the head, it suggests that the 'income effect' of education tends to increase family size while there is a 'substitution effect' of education that tends to reduce the household size. Income tends to provide incentive for higher family size by removing the trade-off between 'quality' and 'quantity' of children.

Rural vis-à-vis Urban Households

In rural areas (Table 12), beyond the income level of 3600, the level of education of the head as well as of the 5-35 year age group increases with income but for the sharp fall noticed for the income group of 96001-150000. This income group seems to assign a low weight to education as noticed in terms of lower educational level of 5-35 year age group. Interestingly, the two lowest income groups attach great importance to education with educational level of 5-35 age group in these two income groups being comparable to the top 4 highest income groups. However, it is not clear how much importance can be attached to this fact, as the number of observations for the first two income groups is very low (4 households in the first category and 13 in the second). The size of the households increases with income between the income level of 1800 and 96000, after which it declines once again. Beyond the category 72001 - 96000 the 'substitution effect' of education outweighs the 'income effect' resulting in smaller family size. It could also reflect increasing nuclearisation of families at very high income levels which could explain why even though there is a fall in education of the head as well as the 5-35 year age group for the 96001-150000 income class, there is still a decline in family size. Another factor that could be important in explaining the small family size at very high income levels could be migration from rural areas to urban areas in search of economic opportunities. This could also explain the fact that household size in urban areas (Table 13) is higher at income level above 150000 as compared to rural areas.

In urban areas (Table 13), a steady increase in educational level is found with increase in income. Clearly education is valued more at higher income levels. The educational level of the 5-35 age group increases sharply from one income level to the other up to the income group of 56001-72000. This may be due to both better perceptions of returns from education

as well as greater opportunities available to realise them and greater capacity to go for higher education. However, the household size shows a general increase with income even though the education of the head and of the younger members increases with income. This could be due to greater affordability of higher family size as well as the effect of migration from rural areas either due to economic reasons or due to educational reasons. On the other hand, for lower income groups, a part of the family may be residing in rural areas due to higher cost of living in urban areas. An area that needs to be explored is whether the problem of housing is giving rise to existence of joint family set-up in urban areas. This also brings forth the view that the income effect of education on family size is positive in urban areas. The decline in family size that we observed in Table 6, thus, may be attributed to the substitution effect of education.

Table 12: Income as a determinant of education, Rural-India

Annual household Income Group (Rupees)	Education of Household head (years of schooling)	Education of 5-35 year age group (average years of schooling)	Household Size (persons)
Upto 1800	2.89	6.16	3.31
1801-3600	1.56	5.07	2.64
3601-7200	2.13	2.07	3.14
7201-14000	1.87	2.23	4.68
14001-28000	3.06	3.14	5.6
28001-56000	5.35	4.94	6.17
56001-72000	5.72	6.48	7.9
72001-96000	5.86	6.31	8.36
96001-150000	5	4.84	7.58
Above 150000	6.09	6.43	5.39
Total	3.55	3.79	5.64

Table 13: Income as a determinant of education, Urban-India

Annual household Income Group	Education of Household head (years of schooling)	Education of 5-35 year age group (average years of schooling)	Household Size
3601-7200	0	0.5	3.17
7201-14000	2.69	2.44	4.6
14001-28000	6.52	5.04	4.7
28001-56000	8.88	6.65	5.11
56001-72000	10.93	9.09	4.88
72001-96000	11.22	9.14	5.17
96001-150000	12.3	9.65	5.71
Above 150000	13.1	10.6	7.19
Total	9.03	7.12	5.1

Below and Above Poverty Households

For below poverty line households again the association between income and education is not very clearly defined (Table 14). The educational level of the younger age group increases with income between the range of 3601-72000 and then falls sharply for 72001-96000, rising again for 96001-150000 group. The size of the household keeps increasing with income. This implies that income is an important determinant of household size; it provides the capacity to satisfy the pent up demand for bigger family. This may be one reason why they do not rise above the poverty line; the increase in income simply gets vitiated by increase in family size. But, it could also be that higher income exists because of the fact that the family size is bigger. The resources at the disposal of the household are higher in terms of the number of members who can contribute in improving the economic condition of the household.

Table 14: Income as a determinant of education, Below Poverty Group

Annual household Income Group (Rupees)	Education of Household head (years of schooling)	Education of 5-35 year age group (average years of schooling)	Household Size (persons)
Upto 1800	0	0	2.06
1801-3600	1.8	5.07	2.9
3601-7200	1.96	1.82	4.22
7201-14000	1.93	2.13	5.45
14001-28000	3.57	2.85	6.81
28001-56000	4.74	4.26	8.2
56001-72000	3.29	7.69	12.62
72001-96000	2.06	3.9	14.48
96001-150000	0	6.07	16.42
Total	3.08	2.93	6.45

The association between income and education is in general positive for the above poverty line households (Table 15) with some small deviations if we ignore the first income group that behaves rather strikingly in contrast (the first two income categories can be ignored because of very small sample size). This again is in contrast to below poverty line households. In general, we find higher average education of the younger age group for the Above poverty line households at each income level than the below poverty line households. This reinforces the view expressed earlier that the demand for education is dependent upon the socio-economic position of the household. The size of the households increases with

income but not as fast as for the below poverty line households and not to the same level. The distinctly smaller family size may have some relation with the fact that household heads have had higher education at higher levels of income and so on the demand side too small families are preferred. It may also be linked to the externalities associated with higher educational level in the immediate social environment. The smaller size of the family along with higher income suggests that the returns to education of earning members are higher as also the need to restrict family size to provide better amenities to the younger generation.

Table 15: Income as a determinant of education, Above Poverty Group

Annual household Income Group (Rupees)	Education of Household head (years of schooling)	Education of 5-35 year age group (average years of schooling)	Household Size (persons)
Upto 1800	6.78	10.55	5
1801-3600	0	0	1
3601-7200	1.91	2.84	1.63
7201-14000	1.88	2.71	3.13
14001-28000	3.68	4.02	4.54
28001-56000	6.9	5.77	5.42
56001-72000	8.81	7.5	5.94
72001-96000	9.6	8.01	6.06
96001-150000	9.96	7.68	6.27
Above 150000	11.19	9.62	6.7
Total	5.95	5.67	5.05

Salaried vis-à-vis Wage Earning Households

We find a clear positive relationship between income and education for the salaried households (Table 16). This group appears to perceive the importance of education. The higher is the income group the higher is the average years of schooling, suggesting that it may have a lot to do with greater value of education as well as the capacity to abstain from entering the labour market earlier. There is an increase in average years of schooling by almost 25.5 per cent for the households above the average income level of Rs. 150000. This is the class where average education of head goes above 13 years of schooling. We had noticed a very sharp rise in income for this educational class (Table 9). Clearly it transforms into a demand for higher education for the younger age group, as the parents would perceive a strong link between education and income. The household size too increases with income, which may again be explained by a variety of factors as noted above in the text. Interestingly,

while the family size goes down for the income group 96001-150000, it rises again for the income group above Rs. 150000.

Table 16: Income as a determinant of education, Salaried Group			
Annual household Income Group (Rupees)	Education of Household head (years of schooling)	Education of 5-35 year age group (average years of schooling)	Household Size (persons)
3601-7200	0	0	1
7201-14000	2.57	4.28	4.2
14001-28000	7.06	5.65	4.78
28001-56000	8.91	6.63	5.27
56001-72000	10.36	8.5	5.77
72001-96000	10.54	8.47	6.01
96001-150000	12.23	9.02	5.85
Above 150000	13.73	11.32	7.4
Total	9.09	7.19	5.38

In the case of wage earners (Table 17), in general, educational level of the younger age group in higher income classes is higher but for the exception that can be noted for the income classes 1801-3600 and 72001-96000 for the 5-35 year age group. There is a strikingly sharp fall in educational level of the 5-35 year age group in the 72001-96000 income class that was noticed for the below poverty line households also. The household size increases with income. The comparatively lower educational level of the younger age group and the bigger family size in the case of wage earners as opposed to the salaried class suggests that the former give greater weightage to quantity of labour rather than quality.

Table 17: Income as a determinant of education, Wage Earning Group			
Annual household Income Group (Rupees)	Education of Household head (years of schooling)	Education of 5-35 year age group (average years of schooling)	Household Size (Persons)
Upto 1800	0	0	1
1801-3600	1.62	5.54	2.58
3601-7200	1.67	1.15	3.18
7201-14000	1.85	2.01	4.71
14001-28000	2.46	2.8	5.59
28001-56000	3.28	4.32	6.45
56001-72000	3.74	5.19	7.64
72001-96000	0	2.67	8.76
96001-150000	7.33	7.6	8.67
Total	2.37	2.85	5.36

In concluding this section it can be said that higher education translates into higher income, but this may be governed by the particular socio-economic position of the household. While education is valued on its own merit by the households having more educated heads, greater value may be assigned to it by households that perceive and can appropriate higher economic returns from it. This in a way substantiates both the consumption and investment aspect of education. It is the investment aspect of education that may be responsible for the difference observed across urban and rural areas, APL and BPL households, and salaried and wage-earning classes.

IV. Years of Schooling and Health Status

Education and health have similar characteristics. They are both embodied in the individual, are influenced by the decision making process at the household level, and have an investment as well as consumption component. Public policies, community-level decision making, and cultural and religious factors also influence them both. It is not easy to define a line of causality between the two. Biological studies have shown that good health is necessary for better education. On the other hand, the level of education is known to affect the health status of the household members. It may be more appropriate to discuss the joint determination of the two. It is impossible to perform controlled experiments to determine the effect of one of these variables on the other. However, we will continue to talk of one as the determinant of the other, as though one of them can be considered as an independent variable changes in which would influence the other.

Education influences health through two channels: one, it influences the level of income that in turn influences the level of consumption, thus, influencing health; two, it can help in increasing the efficiency of converting consumption into better health. The positive effect of education of the parents on the children's health has been well documented. The education of adults may have less effect on their health, as their health would have been determined to a great extent by the income and educational level of their parents. But their education, particularly the education of the mother, does have a positive influence on the children's health.

In Table 18, the relationship between the education of the head of the household and the number of days the earning members of the household were not able to go to work due to illness is not clear. However, as the educational level of the head increases beyond 10 years of schooling, there is a sharp fall in the number of days the earning members were not able to go to work due to illness. The Morbidity per Household also initially increases with the increase in the education level of the head up to 8 years of schooling, then falls for 9-10 years of schooling and then rises again. With respect to the effect of education on child death we observe a decline continuously with a rise in education beyond a year of schooling. Beyond 11 years of schooling it becomes negligible. With respect to expenditure on health too the trend is not very clear. For the two classes where the Morbidity per Household is highest (viz. households where the heads have had 6-8 years of schooling and more than 13 years of schooling), the average household expenditure on health is highest. The higher expenditure and morbidity among the households where the head has had 6-8 years of schooling may be explained by greater perception of morbidity than for the less educated households. Higher education has the indirect effect on health through greater income and direct effect through better living; thus, we find a decline in Morbidity per Household as well as expenditure for the households with 9-10 years of schooling of head. In the case of households where the head has had more than 13 years of schooling the average income level is Rs. 78611 which is the highest. Here we find a rise in expenditure on health, morbidity as well as days not able to work due to illness over the previous class. This may be explained by greater value placed on health, greater perception of morbidity and greater capacity to undertake health-related expenditure including from costlier sources.

Table 18: Effect of Education on health, All-India

Education of Head of Household (years of schooling)	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
0	5.42	11.18	0.07	1178.2
1-5	5.23	11.24	0.59	1203.9
6-8	5.81	13.6	0.41	1853.7
9-10	6.34	11.18	0.12	1448.4
11-12	3.49	11.52	0	1353.6
>13	3.77	12.37	0	1917.9
Total	5.33	11.61	0.2	1380.7

We had earlier noted that education of the parents makes much bigger difference to the health of the child. We do find some evidence to that effect in the table. Another issue related to this is that of gender discrimination. Do households with higher education give equal importance to the health of the girl child as that of the boy child? At this point it may be instructive to look at the female to male ratio in the 0-5 years age group by the schooling level of the head (an approximation for the schooling of the parents).

The female to male ratio is in favour of females where the head has had more than 5 years of schooling except for the class of households where the head has had 9-10 years of schooling which show a strong female disadvantage in child survival (table 19). It is difficult to determine the precise reasons of gender bias in child survival in India, rooted as they are in both cultural and economic factors. Measuring 'economic worth' by labour force participation rate and 'cultural worth' by patrilocal exogamy as an inverse indicator, Kishor (1993 and 1995) has found evidence that the survival chances of the girl child depend on both the factors. The female labour force participation rate per household has been included in Table 19. It is noticeable that in the case of households where the head has had 9-10 years of schooling, the female labour force participation rate is the lowest, thus, upholding the argument that economic worth determines the survival chances of the girl child. In the case of households where the head has had more than 10 years of schooling, female labour force participation rate is not high; here, cultural factors may be more important in determining the female-male ratio of the children. For the households with the lowest education level the female labour force participation rate is highest yet there is some female disadvantage in child survival, which being a resultant of economic and cultural factors, may be ameliorated by increasing education that has an effect on both.

Table 19: Influence of Education of Head and Female Labour Force Participation Rate on Child Female/Male Ratio, All-India

Education of Head of Household (years of schooling)	Female/Male Ratio (0-5 Years)	Female Labour force Participation Rate
0	93.44	30.19
1-5	92.79	19.65
6-8	100.8	15.08
9-10	77.47	9.68
11-12	102.3	13.14
>13	110.4	12.62
Total	93.6	20.89

Rural vis-à-vis Urban Households

In rural areas, the Morbidity per Household is once again highest for the households where the head has had 6-8 years of schooling or more than 13 years of schooling (Table 20). These are also the households that incur the highest expenditures on health. The explanation would be similar to that provided above. The child death per household also shows the same pattern as for all India. A notable difference is that for the households where the head has had 9-10 years of education there is a decline in the days not able to go to work.

Table 20: Effect of Education on health, Rural-India

Education of Head of Household (years of schooling)	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
0	5.4	11.26	0.08	987.56
1-5	5.31	10.62	0.73	1013.7
6-8	5.86	14.32	0.54	1595.5
9-10	3.7	11.9	0.21	1363.2
11-12	2.59	10.72	0	1246.5
>13	4.04	14	0	2848.8
Total	5.13	11.66	0.27	1165.7

Table 21: Influence of Education of Head and Female Labour force Participation Rate on Child Female/Male Ratio, Rural-India

Education of Head of Household (years of schooling)	Female/Male Ratio (0-5 Years)	Female Labour force Participation Rate
0	94.81	31.63
1-5	93.91	22.11
6-8	94.51	17.27
9-10	75.72	10.38
11-12	101.4	14.63
>13	143.7	14.97
Total	93.82	24.43

The female to male ratio becomes favourable to female child only for the households where the head has had more than 11 years of education (Table 21). It is substantially in favour of females for households where the head has had more than 13 years of education. For the households where the head has had 9-10 years of schooling the ratio is worst for females. These households are also associated with the lowest female labour force participation rate. For households with greater education of the head, the crucial factor in

shifting the balance in favour of females is likely to be education and associated with it a greater cultural and social worth of women. The economic worth measured in terms of labour force participation rate of females is higher here than for the households where the head has had 9-10 years of schooling but is significantly lower than for the households where the head has had less schooling. For households with less schooling, it is the economic worth that may be a major reason for the female disadvantage in survival to be much more limited than for the households that have heads with 9-10 years of schooling.

In urban areas again there is no clear trend in linking education with Morbidity per Household (Table 22), but, interestingly, the lowest education households are the ones that incur higher expenditures on health which is contrary to what we saw for all India and for rural India. Since we have seen education and income to be positively related it appears all the more striking. Also no link is observed between expenditure on health and Morbidity per Household. Expenditure on health is a function of at least two factors, namely, (i) 'expenditure on health' to prevent sickness, which may be related positively to level of education; (ii) 'expenditure on health' for treating sickness, which may be higher for lower education and income classes who are generally less health conscious and do not undertake preventive health expenditure, thus ultimately ending up with higher health expenditure for curative purposes. The former type of health expenditure is likely to increase with the level of education while the latter is likely to decrease. Since no hard and fast rule can be expected to exist about the relative strengths of these two opposite forces for different levels of education, the net strength of these two forces does not exhibit a well-defined relationship between education and health expenditure. This could be one possible explanation for the lack of clear relationship between education and health variables. It could also be that the households with lower education would be employed more as wage earners, particularly in urban areas, and hence their economic condition is crucially dependent on their health status necessitating them to go in for higher health expenditure, probably higher in terms of curative health expenditure. It could also be that in rural areas a greater social inter-linkage along with extended family system provides support while in urban areas they have to take recourse to costlier health services due to greater mediation of the market mechanism. In this context, it needs to be noted that if we compare the source of treatment across rural and urban areas by level of education of head it comes out that at lower levels of education there is much larger preference for private health providers than for government health facilities in urban areas (NCAER, 2000). The difference emerges mainly due to greater stress on quality of services in

urban areas, that may again be explained by greater average level of education in urban areas. The cost of treatment per illness in urban areas is substantially higher in private health facilities as compared to government health facilities (NCAER, 2000). There is also the possibility of migration to urban areas for treatment of more intractable diseases. Another possible reason for higher health expenditure in urban areas could be that living in rural areas tends to be healthier than in the polluted and congested urban areas. Child death per household is negligible for all households in urban areas. Since this is not the case in rural areas and average level of education is lower in rural areas, this could imply that even for child health the effect of successive levels of education is less important than the effect of average level of education, an argument made by Caldwell (1980) for fertility change. While the average level of education of the 5-35 year age group comes to around 3.8 years of schooling for rural areas, it comes to around 7.1 years for urban areas. Better public health facilities in urban areas also probably are an explanation of this. The skew noted at the all-India level for the households where the head has had 9-10 years of schooling with respect to days not able to go to work due to illness is explained by the large figure that we see for this category in urban areas.

Table 22: Effect of Education on health, Urban-India

Education of Head of Household (years of schooling)	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
0	5.69	10.47	0	2817.3
1-5	4.95	14.03	0	2030.5
6-8	5.58	11.01	0	2658.8
9-10	10.66	10.18	0	1554.5
11-12	4.2	12.25	0	1441
>13	3.67	11.9	0	1695.6
Total	5.93	11.46	0	1951.3

A glance at Table 23 suggests that the female disadvantage in child survival is non-existent in urban areas only for the households where the head has had between 6-8 and 11-12 years of schooling. If we compare rural and urban areas we find that the households with heads who have had between 6-8, 9-10 and 11-12 years of schooling perform better in urban areas while the rest show a greater female disadvantage in child survival in urban areas. A comparison of the third column for urban areas and rural areas suggests a reason for the worse performance of urban households: a lower economic worth of females as measured by the labour force participation rate. This difference is greatest for the lowest two categories in

terms of educational level of the head. In urban areas the labour force participation rate is, in general, lower than in rural areas, both for males and females (Krishnamurthy, 1984). The rural-urban gap in work participation rates is higher in the case of females than males (Mathur, 1994). The reason for this difference lies in the greater scope available in rural areas for 'informal' employment, particularly in the case of females, within the less regulated and household-based rural work environment. In rural areas women have a greater opportunity to participate in on-farm activities that require as many hands as possible particularly with seasonal variation in labour requirements. More organised wage-labour market in urban areas limit the scope for informal employment, which tends to combine with greater need for learning in urban areas to constrain the size of the workforce, particularly of its female component (Bharadwaj, 1989; Durand, 1975). Mathur (1994) also reports a positive effect of development on female 'household duties' in urban areas apart from absorption of an increasing proportion of population as students at higher levels of development, which tend to reduce female work participation rate. The above factors tend to create greater divergence in participarion rates at lower levels of education than at higher levels of education. For the households that lie in the "middle educational level" (between 6-12 years of schooling), economic worth does not seem to be an explanation for better position of women; the answer must lie in socio-cultural environment which may be influenced by the general level of education. The "cultural worth" of women within the household may be measured by the level of education that is provided to all women in the household.

Table 23: Influence of Education of Head and Female Labour force Participation Rate on Child Female/Male Ratio, Urban-India

Education of Head of Household (years of schooling)	Female/Male Ratio (0-5 Years)	Female Labour force Participation Rate
0	83.06	17.79
1-5	88.73	8.49
6-8	128.1	7.41
9-10	80.59	8.79
11-12	103.3	12
>13	97.15	12
Total	92.85	11.23

For the high-income households the cultural worth may be more important while for the lower income households the economic factors may be more important. Whether we consider the average level of education of the women or years of schooling of the head, the category of 9-10 years of schooling shows the worst female-to-male ratio. For this category

the economic factors are likely to be more important. As can be seen from the table, the female labour force participation rate is lowest for this category as an average for all-India and for rural India; for urban India it is not the lowest but remains low. Thus, this reinforces the view that to improve the position of women income, education and employment need to be tackled simultaneously.

Above and Below Poverty Line Households

Considering the below poverty line households (Table 24), it can be seen that the Morbidity per Household is fairly the same for most of the households across different levels of education of the head. So far as days that the earning members could not go to work is concerned, there is an abnormally high figure for the households that have heads with 9-10 years of schooling and a very low figure for the households that have heads with 11-12 years of schooling. To interpret this result is difficult except a conjecture that the two variables may not be correlated. The households that have heads with 9-10 years of schooling are not only the ones that have the lowest Morbidity per Household but also incur the lowest expenditure on health. The highest expenditure is incurred by households that have heads with more than 13 years of schooling, which is almost ten times that of the lowest, but the Morbidity per Household correspondingly is not the lowest. It suggests that the expenditure incurred on health is not per se the determinant of good health; nor does a higher Morbidity per Household necessarily imply a higher expenditure on health as can be seen for the category of households that have heads with 11-12 years of schooling. So far as child mortality is concerned, if we ignore the first row we find a decline for the next two levels and it is negligible for the rest. Since the households where the heads have had 9-10 and 11-12 years of education are the ones that spend the lowest amounts on an average on health, the conclusion may be derived that education of parents and guardians is more important than expenditure on health for the health of the child.

The female-to-male ratio becomes favourable to females where the head has had more than 6 years of schooling (Table 25). The female labour force participation rate declines with the increase in the education of the head of the household. Thus, education level of the household is more important in reducing the female disadvantage in child survival than the economic worth of the females. The highest female-to-male ratio is found for middle-

educated households (6-10 years of schooling of the head). However, the overall average remains against females. This is because the lower educated households have a greater overall weight among the Below Poverty Line households. Here the economic worth of females is higher and that may be the reason why the ratio has not fallen lower. Schooling is likely to be more important a factor in reducing the female disadvantage in child survival.

Table 24: Effect of Education on health, Below Poverty Group

Education of Head of Household (years of schooling)	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
0	3.03	10.35	0.05	1061.5
1-5	4.42	10.73	1.62	1060.6
6-8	8.12	10.82	0.89	1495.9
9-10	26.08	6.44	0	443.84
11-12	1.6	12.84	0	715.56
>13	3.94	10.75	0	4249.8
Total	5.16	10.21	0.45	1105.3

Table 25: Influence of Education of Head and Female Labour force Participation Rate on Child Female/Male Ratio, Below Poverty Group

Education of Head of Household (years of schooling)	Female/Male Ratio (0-5 Years)	Female Labour force Participation Rate
0	94.23	28.65
1-5	93.53	15.8
6-8	118.5	14.7
9-10	122.5	11.79
11-12	102.4	12.44
>13	101.4	11.23
Total	98.77	22.22

In the case of above poverty line households (Table 26) there is more or less a decline in the number of days not able to go to work with increase in the educational level of the head of the household. Morbidity per Household turns out to be the highest for middle-educated and more educated households. These are also the households that spend more on health; thus, the linkage may be more from perception of morbidity to expenditure. Child mortality per household on an average is lower for the APL households than for the BPL households and within APL category it is not negligible for households that have heads with 6-8 and 9-10 years of schooling. From policy perspective it implies that it is more important to concentrate on "middle-educated middle-income" households.

The female-to-male ratio declines with increase in the educational level of the head of the household up to 9-10 years of schooling in the case of Above Poverty Line households (Table 27). For the lower educated households (first two categories) the economic worth of the females measured by the female labour force participation rate seems to be the more important reason for a higher female-to-male ratio for the 0-5 years population. The female labour force participation rate declines substantially for the next two educational categories and so does the female-to-male ratio. Yet the answer to decline in child female/male ratio cannot simply lie in decline in economic worth of females for we have seen that in BPL households also there is a decline in female labour force participation rate for the middle educational level of the head but the child female/male ratio turns in favour of females. The answer must lie in a mix of economic and cultural factors. For the highest two educational categories the female/male ratio is highest even though the economic worth of the women does not improve markedly. Here the reason has to be found in the effect of education on the intra-household division of resources and the positive contribution of education in improving the cultural worth of the women.

It appears that the below poverty line households respond much faster to education than the above poverty line households so far as reduction in female disadvantage in child survival is concerned.

Overall, the female disadvantage in child survival is much greater in urban areas, among above poverty line households and in the case of middle educated households rather than in rural areas, among Below poverty line households and other educational categories respectively.

Table 26: Effect of Education on health, Above Poverty Group

Education of Head of Household (years of schooling)	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
0	7.41	11.97	0.09	1263.7
1-5	5.8	11.62	0	1286.8
6-8	5	14.94	0.22	1997.8
9-10	3.52	12.5	0.14	1689.1
11-12	3.86	11.3	0	1442.8
>13	3.75	12.53	0	1750.3
Total	5.41	12.42	0.08	1506.6

Table 27: Influence of Education of Head and Female Labour force Participation Rate on Child Female/Male Ratio, Above Poverty Group		
Education of Head of Household (years of schooling)	Female/Male Ratio (0-5 Years)	Female Labour force Participation Rate
0	92.26	31.39
1-5	91.9	22.16
6-8	89.53	15.25
9-10	64.51	9.18
11-12	102.2	13.23
>13	112	12.71
Total	89.05	20.25

Salaried vis-à-vis Wage Earning Households

In the case of salaried households (Table 28) there is a decline in the days the earning members were not able to go to work due to illness with the rise in the educational level of the head, except for the households where the head has had 11-12 years of schooling. Morbidity per Household is once again highest in the case of households where the head has had 6-8 years of schooling and second highest for households where the head has had more than 13 years of education. Child mortality is also highest for households that have heads with 6-8 years of schooling. This is also the category that incurs the highest expenditure on health. The households with the lowest Morbidity per Household show the lowest expenditure on health. Thus, once again it is noted that household expenditure on health is not an important factor in reducing morbidity or mortality. A rise in educational level, greater public spending and the overall socio-cultural environment are more important determinants of health.

Table 28: Effect of Education on health, Salaried Group				
Education of Head of Household (years of schooling)	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
0	5.47	10.25	0	1990.7
1-5	4.51	9.24	0.48	1013.2
6-8	4.35	11.86	1.16	3122.7
9-10	3.56	10.53	0.28	1727.7
11-12	4.43	10.81	0	1158.2
>13	3.39	11.56	0	1517.7
Total	4.15	10.75	0.24	1719.7

The female/male ratio is highest for the households that have heads with 6-8 years of schooling (Table 29). In fact it is the only category for which there is a female advantage in child survival. Even with higher economic worth of women in terms of labour force participation rate there remains a substantial disadvantage in survival of female children, which is not completely wiped off even by a rise in educational level. Clearly, the cultural environment among the salaried households does not appear to be favourable to female child. Given the fact that the major asset of these households is labour, it may require a much higher female labour force participation rate to improve their 'economic worth'. Cultural factors may be responsible in restricting greater female participation in economic activities.

The wage earning households (Table 30) show a much greater number of days for which the earning members were not able to go to work due to illness than the salaried households except where the heads have had 11-12 years of schooling or more than 13 years of schooling. The Morbidity per Household is lowest for households with heads who have had 11-12 years of schooling although these households incur the lowest expenditure on health. Households that have higher Morbidity per Household incur highest expenditure. The figure of child mortality is non-negligible only for households that have heads with 1-5 years of schooling. Again it appears that more than household expenditure on health, it may be education, public spending and the overall socio-cultural environment that are important determinants of health.

Table 29: Influence of Education of Head and Female Labour force Participation Rate on Child Female/Male Ratio, Salaried Group

Education of Head of Household (years of schooling)	Female/Male Ratio (0-5 Years)	Female Labour force Participation Rate
0	85.61	23.45
1-5	77.67	14.91
6-8	122.9	9.67
9-10	66.56	12.7
11-12	87.79	13.08
>13	96.48	13.31
Total	86.91	14.68

Table 30: Effect of Education on health, Wage Earning Group				
Education of Head of Household (years of schooling)	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
0	6.32	10.63	0.08	1013.9
1-5	7.12	10.94	0.48	1122.9
6-8	9.02	9.83	0	720.69
9-10	23.28	10.64	0	1089.4
11-12	1.78	4.95	0	288.75
>13	0.79	10.2	0	820.24
Total	7.77	10.48	0.14	991.75

The wage-earning households show an almost ubiquitous female disadvantage in child survival across all educational categories except for the category of households where the heads have had more than 13 years of schooling (Table 31). This latter is also the category where the economic worth of women is greatest. The households show the greatest female disadvantage in child survival where the head has had 9-10 years of schooling, which is also the category with lowest female labour force participation rate. For the first educational category (i.e., where the heads have had no schooling) we observe a very high female labour force participation rate but the female/male ratio remains highly skewed against the female child. For the next educational category a decline in female labour force participation rate is observed but the child female/male ratio improves. This may be because the economic worth of women with nearly 30 percent labour force participation rate still remains important while a rise in educational level results in greater cultural worth of women. It could also imply a better utilisation of public health facilities along with improvement in living conditions due to education. The households in the next two educational categories show not only a decline in labour force participation rate for females but also a worsening female-to-male ratio in the child population. The worst case is that of households where the heads have had 9-10 years of schooling. Thereafter, both rising education and rising participation of women in economic activity result in improving female/male ratio among children. Once again the female disadvantage in child survival appears to be most acute for middle-educated households with low female labour force participation rate.

Table 31: Influence of Education of Head and Female Labour force Participation Rate on Child Female/Male Ratio, Wage Earning Group		
Education of Head of Household	Female/Male Ratio	Female Labour force Participation Rate
(years of schooling)	(0-5 Years)	
0	87.6	40.94
1-5	92.73	29.54
6-8	89.86	26
9-10	66.19	15.67
11-12	99.88	25.14
>13	166.4	49.65
Total	87.95	35.35

In the case of wage-earning households the female labour force participation rate on an average is quite high while it is not that high for the salaried households. The child female/male ratio is also better in wage-earning households. Overall, the answer to the female disadvantage in child survival must lie in the cultural position of women that may be influenced more by the general level of education in the society, public policies and greater participation by women in economic activities rather than just education within the household.

The linkage between education and health cannot be determined in a straightforward manner due to the complexities introduced by the problem of subjectivity in perception. The morbidity indicator suggests that the perception of morbidity is highest among households with heads that have had 6-8 years or more than 13 years of schooling. It may be argued that there are gaps in perception level that are bridged at successive levels of schooling. Increase in schooling may take care of certain kinds of health problems but beyond the threshold level of 13 years of schooling it may increase the level of perception for new forms of health problems. Child mortality is negligible where heads of households have had above 10 years of schooling and female disadvantage in survival turns out to be most acute in the case of heads with 9-10 years of schooling where the female participation in labour force is lowest. The state has a role to play by improving the quality of service in government health facilities, increasing the general level of education in society and providing greater incentives to women to participate in economic activities.

V. Health Status and Household Earnings

The relationship between health and income is generally considered to be bi-directional. Income determines the access to means of health care and nutrition. The link between nutritional level and health is well established. The reverse linkage from health to income is less well understood and documented. In general, it is argued that better health results in higher productivity that implies higher wages or income. However, there are problems related to the measurement of health status due to subjectivity in perception and hence in interpretation (Sen 1993) that tend to create further problems in understanding this linkage. Thus, USA tends to show higher self-perceived morbidity than India and across Indian states Kerala shows the highest rate of morbidity. The perception of morbidity may be directly linked to the educational status of the population under observation. Thus, while economic logic suggests that health indicators, particularly with reference to morbidity, should be better for higher income groups, empirical studies tend to show that it is much worse for higher income groups.

Table 32 does not show us the relationship as would be expected on theoretical grounds. The rate of morbidity per person per annum initially increases with income up to the income level of Rs. 7200, then declines up to the income level of Rs. 150000 and then rises up again for income level above that. When we consider the number of days the working members were not able to go to work, we find a completely haphazard trend except above the income level of 72000 where we find a declining trend. For child death per household also we do not find a clear-cut trend but our earlier contention that from policy perspective it is important to concentrate on "middle-income middle-educated" households is upheld. The expenditure on health is in general higher for higher income groups (with exceptions) but what is notable is that low income households spend a higher proportion of their income on health.

Table 32: Income as a determinant of health, All-India				
Annual Household Income Group	Days Not Able to Work due to Illness	Morbidity Rate	Child Death per Household	Expenditure on Health (per year per household)
Upto 1800	6.06	10.57	0	237.99
1801-3600	1.8	12.2	0	150.24
3601-7200	4.39	16.89	0	1545.31
7201-14000	3.41	13.15	0.14	877.35
14001-28000	6.83	11.93	0.37	1137.47
28001-56000	4.8	11.36	0.06	1692.62
56001-72000	5.34	10.07	0.35	1741.49
72001-96000	4.15	10.26	0	2016.03
96001-150000	4.59	8.45	0	1934.32
Above 150000	1.99	10.43	0	2201.54
Total	5.33	11.61	0.2	1380.71

The picture with respect to rural India and urban India is not very different from the all-India one so far as linkage between income and health indicators is concerned. The same comments are applicable to both as for all-India. A comparison of rural and urban areas does show that in general expenditure on health in urban areas is relatively higher and that child death per household is negligible in urban areas for all income groups.

Table 33: Income as a determinant of health, Rural-India				
Annual Household Income Group	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
Upto 1800	6.06	10.57	0	237.99
1801-3600	1.8	12.2	0	150.24
3601-7200	3.11	16.53	0	1544.63
7201-14000	3.47	13.23	0.15	816.56
14001-28000	5.98	11.62	0.44	1002.26
28001-56000	5.17	11.47	0.09	1531.23
56001-72000	5.59	8.75	0.77	1312.50
72001-96000	4.36	11.47	0	2760.28
96001-150000	4.97	6.78	0	1624.98
Above 150000	1.43	8.04	0	563.26
Total	5.13	11.66	0.27	1165.69

Table 34: Income as a determinant of health, Urban-India				
Annual Household Income Group	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
3601-7200	15.1	20.75	0	1552.5
7201-14000	2.28	11.81	0	1869.39
14001-28000	11.05	13.77	0	1810.48
28001-56000	3.97	11.11	0	1978.8
56001-72000	5.1	11.87	0	2101.1
72001-96000	3.95	9.3	0	1650.62
96001-150000	4.42	9.53	0	2084.2
Above 150000	2.1	11.09	0	2814.03
Total	5.93	11.46	0	1951.31

Below and Above Poverty Line Households

For the below poverty line households (Table 35) again we find no clear linkage between income and morbidity per person or between income and days the working members were not able to go to work. The expenditure on health also does not show any clear linkage with income or with morbidity per person. However, for above poverty line households (Table 36) we do find the theoretical logic to be valid to some extent. Morbidity per person shows a continuous decline with rise in income in the range of Rs. 1801 to 150000. The expenditure on health also shows a more or less consistent increase with income level, thus offering a part of the explanation for this observed trend. Days the working members were not able to go to work initially increases and then declines although not very consistently. The very low figures observed for low income groups is likely to be due to the fact that economic constraints may not allow staying away from work rather than a lack of illness.

Table 35: Income as a determinant of health, Below Poverty Group				
Annual Household Income Group	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
Up to 1800	7	25.67	0	316.51
1801-3600	2.22	10.42	0	110.15
3601-7200	5.86	14.1	0	1984.34
7201-14000	2.71	11.39	0.12	866.94
14001-28000	7.19	10.09	0.72	1064.48
28001-56000	2.48	8.75	0.44	1687.14
56001-72000	17.47	1.34	0	155.08
72001-96000	0	4.28	0	1508.46
96001-150000	6.16	13.68	0	3938.13
Total	5.16	10.21	0.45	1105.32

A comparison of the two categories (APL and BPL) shows that the morbidity per person is higher for APL households for comparable income groupings except at the two extremes of income level, viz. up to 1800 and 96001-150000. Thus, the problem of perception of morbidity seems to be related more with the category to which the household belongs rather than merely the difference in income. Child mortality figures again do not suggest any clear trend except that it is notable only in the middle income range and is lower in the case of APL households.

Table 36: Income as a determinant of health, Above Poverty Group

Annual Household Income Group	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
Upto 1800	0	2.2	0	132
1801-3600	0	45.48	0	409.35
3601-7200	1.6	27.02	0	930.14
7201-14000	4.87	19.28	0.18	898.23
14001-28000	6.56	13.78	0.13	1186.47
28001-56000	5.18	11.95	0	1693.44
56001-72000	5.19	10.99	0.37	1820.13
72001-96000	4.23	10.54	0	2025.94
96001-150000	4.56	8.39	0	1925.07
Above 150000	1.99	10.43	0	2201.54
Total	5.41	12.42	0.08	1506.56

Salaried and Wage Earning Households

The wage-earning households (Table 37) present a similar picture to the BPL households while the salaried households (Table 38) present a slightly more ordered picture as seen in the case of APL category. While the salaried households present a consistently low number of days the working members were not able to go to work, there are large variations seen in the case of wage earners. The low figures for low-income groups of wage earners again suggest the lack of economic capacity to stay away from work rather than low illness. In terms of morbidity per person too we find a decline with rise in income in the case of salaried households with exceptions but in the case of wage earners it is a more haphazard trend. However, when we compare morbidity per person across the two categories by respective income levels we do not find any trend; morbidity is neither consistently higher nor lower for salaried households as compared to wage earners. The expenditure on health almost consistently increases with income in the case of wage earners with the exception of

highest income group. Similar is the case of salaried households with the exception of income groups 7201-14000 and 96001-150000. For the salaried households it is also evident that the lower income groups spend a high proportion of their income on health. Since the average income of the salaried households is on the higher side while wage earners come on the lower end, it can once again be concluded that for higher income groups health and income show a positive association.

Table 37: Income as a determinant of health, Wage Earning Group

Annual Household Income Group	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
Upto 1800	0	0	0	0
1801-3600	0	4.79	0	31.11
3601-7200	2.11	22.18	0	669.25
7201-14000	3.97	13.5	0.09	916.18
14001-28000	11.16	8.75	0.22	905.33
28001-56000	7.26	9.34	0	1542.57
56001-72000	11.63	21.2	0	1897.51
72001-96000	8.13	18.92	0	3107.41
96001-150000	17	3.85	0	2003.6
Total	7.77	10.48	0.14	991.75

Table 38: Income as a determinant of health, Salaried Group

Annual Household Income Group	Days Not Able to Work due to Illness	Morbidity per Household	Child Death per Household	Expenditure on Health (per year per household)
3601-7200	0	100	0	1200
7201-14000	4.49	13.56	0	2175.33
14001-28000	2.75	13.81	1.19	1249.36
28001-56000	4.39	10.83	0	1705.96
56001-72000	4.38	8.95	0	1718.88
72001-96000	6.68	8.42	0	2080.37
96001-150000	4.85	8.52	0	2043.61
Above 150000	1.93	11.61	0	2661.06
Total	4.15	10.75	0.24	1719.72

We have documented above the effect of income on various health indicators per household. Now we classify income based on one health indicator. Here we have used the average number of days for which all the members of the household were ill in a month. To some extent the idea that income tends to fall with worsening health can be considered to be tenable from the table. The average income per household tends to decline, as the average

number of days of illness of members of the household tends to increase except for the households with the highest average illness. Thus, the theoretical argument of better health having a positive impact on income is largely upheld at the household level. Expenditure on health shows a varying pattern with illness and is lowest for the households with average illness of less than one day. Higher illness does not necessarily imply a higher expenditure on health. This is because while higher illness would require higher expenditure on health, it also implies a reduction in income, which would reduce the capacity to undertake such expenditure.

In rural areas too we observe a decline in income with increasing illness in the household but the number of exceptions is two: where the average illness is 16-20 days and for the highest illness group (Table 40). Expenditure on health on the contrary increases throughout except for the illness level of 21-25 days. Thus, declining income level does not necessarily imply reduced health expenditure; on the contrary expenditure level in general increases.

Table 39: Health as a determinant of Income, All-India

Average days members were ill per month per household	Income per household	Expenditure on Health per year per household
0	37014.82	135.66
1-5	34216.88	1834.46
6-10	29010.26	4231
11-15	28260.37	5890.37
16-20	27259.28	5037.53
21-25	21038.3	3628.3
>25	36306	5836.06
Total	35694.24	1380.71

In urban areas the figures become even less compatible with theory. The income level declines with increasing illness in the households initially up to the illness level of 6-10 days and then the trend breaks. The highest income level comes out to be for the households with 21-25 days illness and the second highest is for households with no illness. Expenditure on health shows an increasing trend initially, declines sharply for illness level of 16-20 days and then rises again. Expenditure on health does seem to be determined by the health status if we ignore the intermediate level of illness of 11-20 days of illness.

Table 40: Health as a determinant of Income, Rural-India		
Average days members were ill per month per household	Income per household	Expenditure on Health per year per household
0	28038.98	125.76
1-5	26040.10	1758.46
6-10	23196.79	3210.69
11-15	20570.88	3489.16
16-20	23034.84	4408.54
21-25	18930.76	3480.96
>25	30574.76	4449.51
Total	27411.20	1165.69

Table 41: Health as a determinant of Income, Urban-India		
Average days members were ill per month per household	Income per household	Expenditure on Health per year per household
0	60021.68	161.03
1-5	56695.68	2082.69
6-10	46304.20	7136.02
11-15	49185.35	11970.32
16-20	42441.72	6623.64
21-25	75560.00	7440.00
>25	51955.60	9746.04
Total	57675.07	1951.31

For salaried households also the trend is mixed (Table 42). Initially the income level declines with increasing illness and then it shows a mixed trend. Similarly the expenditure on health initially increases with rising illness level but then shows a mixed trend.

In the case of wage earners (Table 43) too the theoretical conjectures are different from what the data suggest. At initial levels of illness the income level declines with increasing illness but then the trend breaks from 11-20 days of illness. Expenditure on health increases initially and then starts declining. It is difficult to conjecture a precise relationship between income and health from the data that we have at the household level.

Table 42: Health as a determinant of Income, Salaried Group		
Average days members were ill per month per household	Income per household	Expenditure on Health per year per household
0	56083.78	155.06
1-5	51001.98	2486.16
6-10	43408.06	3979.18
11-15	50448.32	3657.15
16-20	60026.63	3340.19
21-25	38806.23	7780.84
>25	59042.42	12345.81
Total	54375.49	1719.72

Table 43: Health as a determinant of Income, Wage Earning Group		
Average days members were ill per month per household	Income per household	Expenditure on Health per year per household
0	19073.19	102.79
1-5	18178.41	1482.6
6-10	14959.73	3317.57
11-15	15420.02	4778.83
16-20	23239.91	6205.35
21-25	15297.14	4998.67
>25	20200.59	3658.09
Total	18816.67	991.75

Thus, overall while health shows improvement with rise in income for higher income level households, no clear-cut trend is observed for lower income groups. When income is classified on the basis of the health status of the households no clear-cut trend is observed except at lower levels of illness where income is seen to decline with rising illness.

Some General Observations

It has emerged from the above analysis that merely household expenditure on education or health is not enough to bring about the desirable transformation in the society. Problems of income, health and education have to be dealt with simultaneously in order to start a virtuous circle that would be sustainable. We have looked at the demand side and it has

emerged that the linkage between education and income as well as education and health is more clearly defined than the linkage between health and income. Thus, we may look at the supply-side factors related to education, an important determinant of which is expenditure incurred by state. It has also emerged from our study that a generally higher level of education in the society may be a more important factor in restricting family size, and hence in increasing the income per member of the household, than successive levels of education. Thus, the externalities associated with education are more important than the returns from education for an individual or a household. This requires us to focus on education as a means of breaking out from the trap that we find ourselves in, which gains greater relevance in the current situation of liberalisation.

The two issues of whether education is to be treated as consumption or investment and as a public or private good are closely related to the issue of financing of education, particularly for developing countries. If it is seen as consumption good that is private in nature then the market mechanism may be regarded as the most effective means of ensuring its adequate supply and its consumption must be reduced to increase investment. However, education not only offers private monetary as well as non-monetary benefits to its consumers but also has externalities associated with it that confer benefits to the society at large, even on those who have not had any education. Thus, it combines in it the nature of both an investment good and a consumption good (Blaug, 1970) and public as well as private good (Musgrave, 1959). Apart from its intrinsic importance, education serves other roles in ensuring the freedom of a person (Dreze and Sen, 1995) for making effective use of the available socio-economic opportunities and in reducing the extent of child labour as well as various inequalities.

The nature of education as expressed above lays the responsibility of financing education on both, the government and the individual. There are few practical problems in which the economist has a more direct interest then those relating to the principles on which the expense of the education of children should be divided between the state and the parents (Marshall, 1910: 217). The state is concerned with the macro effects of education over a much longer time horizon and so its objectives are much different from that of the individual who is concerned with the immediate returns of education to him and his family over a life-time. The objectives of economic growth with equity and the externality associated with education make public financing of education imperative (Tilak, 1989). The benefits that

accrue to the individual in terms of higher earning are a reason why the individual should pick up a part of the cost. If we look at the state as a supplier of education and the individual as a buyer of it then investments by both appear to be complementary; and this may be the best model on grounds of equity[1]. Hence, the right balance between public and private expenditures is crucial to the success of any educational policy or programme (Psacharapoulos and Woodhall, 1985; Majumdar, 1983).

Since the highest social and private rates of return have been observed for primary and elementary education than for higher education (Tilak, 1987; Blaug *et al.*, 1969), financing of elementary education is emphasised. Elementary education also gains relevance as it is the base of the educational pyramid and the success of East-Asian economies has given further credence to the idea of having a wider educational base (World Bank, 1993). The sources of finance in India are the Central and the State Governments, local bodies, consumers of education (fees, etc.), and foreign aid. Primary among these is the source of state governments. However, the role of the Central Government is crucial as its expenditure is of strategic importance that not only expands existing programmes but also funds new programmes and initiatives.

VI. Trends in Financing of Elementary Education and Outcome

The share of expenditure on education in GDP reflects the importance attached to education in a country's development goals. This share increased from 1.27 percent in 1951 (not given in the table) to 2.96 percent in 1975-76 (Table 44), i.e., education more than doubled its share in GDP. It peaked at 4.34 percent of GDP in 1990-91 after which it suffered a decline from which it never recovered, although it remained higher than the levels achieved in the eighties. The target of 6 percent of GDP (Government of India, 1968) was never achieved. Elementary education was always accorded highest priority in government budgets and reached the maximum in 1996-97 of 50 percent of total central and state government budgets (Budget estimate).

[1] Milton Friedman (1955) has presented a laissez-faire view of financing education where the primary responsibility of the state is to *enforce contracts, prevent coercion and keep markets free.* There can be three reasons for making an exception: monopoly or market imperfections exist, external or neighbourhood effects' are important, and thirdly, in favour of those who cannot take responsible decisions like children.

A study by IAMR of sixteen major states to measure the level of educational deprivation for the two years 1991 and 1996 of the reforms period has considered financial allocation as one of the major variables in measuring the educational status of the states (IAMR, 1999). The indicators considered for educational achievement were literacy rate, enrolment ratio at primary level, enrolment ratio at secondary level and retention rate. The indicators that were used for resource allocation are per capita allocation on elementary education and percentage of educational expenditure to elementary education. In terms of educational achievement the states of Bihar, Rajasthan and Uttar Pradesh were the most deprived in both 1991 and 1996. Andhra Pradesh and Orissa that were at par with all-India in 1991 were added to the list of more deprived than all-India average in 1996. Assam and Madhya Pradesh were at par with all-India in 1991 but improved their position by 1996. In terms of resource allocation, Orissa, Uttar Pradesh and Haryana were more deprived than all-India in both 1991 and 1996. Maharashtra, Rajasthan and Bihar were added to the list of more deprived in resource allocation than all-India in 1996. The study concludes that per-capita allocations were low for the states with higher deprivation values and high for the states with lower deprivation values and that a substantial increase is necessary to reduce deprivation levels. Haryana, Bihar, Rajasthan, Maharashtra, and West Bengal experienced the greatest increase in deprivation in terms of resource allocation. Haryana and Uttar Pradesh also experienced increase in relative deprivation in terms of quality of education.

Table 44: Trends in Expenditure on Education

Year	Educational Expenditure as Percentage of GDP (current prices) - All India	Percentage Allocation of Total (Center + State) Budget to Elementary Education
1975-76	2.96	46.2
1980-81	2.97	45.5
1985-86	3.19	46.2
1990-91	4.34	46.3
1991-92	4.1	46.3
1992-93	4.13	45.2
1993-94	3.96	46.9 (RE)
1994-95	3.78	46.3 (BE)
1995-96	3.91	47.3 (BE)
1996-97	3.8	50.1 (BE)

Source: Government of India, 1998.

The above analysis brings out that the allocation for elementary education is important in achieving success in educational objectives. Since a greater part of the spending effort is undertaken by the states, their expenditure pattern needs to be reviewed. This needs to be complemented by the pattern of household spending. Since the expenditure on education on capital account is of very small magnitude the expenditure on revenue account alone has been considered.

Table 45 shows the state-wise revenue expenditure on elementary education. While most of the states show a marked increase in revenue expenditure in the period immediately preceding the reforms, the states of Uttar Pradsesh and Orissa show the highest increase with almost a doubling of expenditure. Expenditure on elementary education was hit the hardest in the year 1991-92 when ten out of the sixteen major states we have considered showed a negative growth rate. It picked up slowly after that but not for all states. The states that have been of greatest concern like Uttar Pradesh, Bihar and West Bengal in fact suffered a decline even in absolute amount when we compare 1990-91 figures with 1995-96 figures. Andhra Pradesh and Punjab increased the expenditure only marginally. However, there is a slight hitch in comparing the figures for 1994-95 and 1995-96 with the rest of the years because of the difference in source from which the figures have been taken. But the result is not likely to be too much off line from reality. If we look at the figure for all states and UTs combined then too we find a much higher annual growth rates for the pre-reforms period than for the reforms period. If we ignore the one exceptional year of 1987-88 then the same result does not hold for the expenditure incurred by the centre. This was the year when NPE was brought within the budget provisions and so we find nearly 500 percent increase in expenditure. Barring this exception the Centre's contribution towards elementary education seems to have increased steadily in the reforms period. But such stability is not found in the contribution made by the states during the reforms period. West Bengal shows a negative growth rate for the entire reforms period. For the entire ten year period, the states of Andhra Pradesh, Bihar and West Bengal have shown the greatest instability in expenditure in terms of a much larger number of years in which there was a negative growth rate. In the case of West Bengal, as already noted above, it was entirely concentrated in the reforms period.

Comparing the average annual growth rates for the pre-reforms and the reforms periods (Table 46), we generally find a sharp decline in the rate of growth of revenue expenditure on elementary education in the period immediately following the introduction of

reforms (viz. 1991-92 to 1993-94) that tends to get corrected when we consider a longer-time period in the reforms period. The exceptions are Gujarat that shows a continuous increase and Karnataka that shows an increase in the initial period of reforms and a subsequent decline. Maharashtra, Gujarat and Assam managed to overcome the initial shock of reforms so that the rates of growth during 1991-92 to 1995-96 turn out to be higher than during 1985-86 to 1990-91. On the other hand, Andhra Pradesh, Himachal Pradesh, Karnataka and Punjab have shown a lower rate of growth for the entire reforms period than in the initial years of the reforms. But, the states of Bihar, Uttar Pradesh and West Bengal show a negative growth rate for the entire reforms period. Overall, reforms have had a negative impact on the rate of growth of revenue expenditure on elementary education and the recovery has not been enough even over a longer time horizon except for Maharashtra, Gujarat and Assam.

If we look at the period between 1985-86 to 1993-94 (we ignore the terminal years due to inconsistency in data), then the states of Bihar, Madhya Pradesh and Maharashtra have the highest rates of growth. Assam, Uttar Pradesh and Andhra Pradesh turn out to have the lowest rates of growth of expenditure on elementary education. What we need to do is to complement the analysis of trends in financing of elementary education with the results in terms of educational achievements and the level as well as quality of services.

Table 45: Revenue Expenditure on Elementary Education at 1980-81 prices

(in Rs. Lakhs)

State	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96 (RE)
Andhra Pradesh	16,280	16,191	18,635	17,999	21,844	20,189	19,354	21,623	21,279	21,444	20,391
		(-0.55)	(15.10)	(-3.42)	(21.36)	(-7.58)	(-4.14)	(11.72)	(-1.59)	(0.78)	(-4.91)
Assam	8,297	12,169	9,294	10,119	10,169	11,079	11,971	12,655	13,113	12,049	16,281
		(46.66)	(-23.63)	(8.88)	(0.49)	(8.96)	(8.05)	(5.71)	(3.62)	(-8.11)	(35.12)
Bihar	21,044	18,027	32,734	28,340	34,207	33,364	30,624	30,250	30,972	31,392	32,755
		(-14.34)	(81.58)	(-13.42)	(20.7)	(-2.46)	(-8.21)	(-1.22)	(2.39)	(1.35)	(4.34)
Gujarat	18,435	14,395	16,193	18,436	19,421	20,719	20,975	20,064	22,535	24,910	26,582
		(-21.92)	(12.49)	(13.85)	(5.34)	(6.68)	(1.24)	(-4.35)	(12.32)	(10.54)	(6.71)
Haryana	4,125	4,282	5,360	5,569	5,761	6,461	6,093	6,905	6,599	7,092	7,965
		(3.79)	(25.19)	(3.90)	(3.44)	(12.16)	(-5.70)	(13.33)	(-4.44)	(7.48)	(12.30)
Himachal Pradesh	2,532	2,770	3,342	3,990	4,626	4,599	3,922	4,390	5,373	4,398	5,033
		(9.40)	(20.65)	(19.40)	(15.95)	(-0.59)	(-14.72)	(11.92)	(22.41)	(-18.15)	(14.44)
Karnataka	13,191	14,203	16,913	17,360	18,207	18,106	18,131	21,382	24,595	21,274	22,607
		(7.67)	(19.08)	(2.64)	(4.88)	(-0.56)	(0.14)	(17.93)	(15.02)	(-13.50)	(6.27)
Kerala	14,031	15,328	15,121	16,037	15,967	17,722	15,861	16,369	17,510	19,414	21,711
		(9.25)	(-1.35)	(6.06)	(-0.44)	(10.99)	(-10.50)	(3.20)	(6.97)	(10.87)	(11.83)
Madhya Pradesh	15,186	16,799	16,938	18,824	20,550	23,082	22,883	25,551	24,542	24,247	28,493
		(10.62)	(0.83)	(11.14)	(9.17)	(12.32)	(-0.86)	(11.66)	(-3.95)	(-1.20)	(17.51)
Maharashtra	23,979	29,389	27,765	28,919	33,893	30,651	34,331	36,232	32,252	37,435	44,398
		(22.56)	(-5.52)	(4.15)	(17.20)	(-9.56)	(12.01)	(5.54)	(-10.99)	(16.07)	(18.60)
Orissa	5,800	7,256	9,669	10,472	11,517	10,856	12,120	14,929	13,319	13,213	15,884
		(25.12)	(33.24)	(8.32)	(9.97)	(-5.74)	(11.64)	(23.18)	(-10.78)	(-0.80)	(20.22)
Punjab	5,361	5,185	6,178	6,258	8,461	7,212	6,523	7,502	7,760	6,710	7,375
		(-3.28)	(19.15)	(1.30)	(35.21)	(-14.77)	(-9.54)	(14.99)	(3.44)	(-13.52)	(9.90)
Rajasthan	11,579	12,574	13,903	15,016	17,032	19,253	17,540	18,760	19,203	23,492	25,230
		(8.60)	(10.56)	(8.01)	(13.43)	(13.04)	(-8.90)	(6.95)	(2.37)	(22.33)	(7.40)
Tamil Nadu	18,287	17,235	19,399	19,968	23,021	27,718	28,466	26,363	28,870	26,329	30,133
		(-5.75)	(12.55)	(2.94)	(15.29)	(20.40)	(2.70)	(-7.39)	(9.51)	(-8.80)	(14.45)
Uttar Pradesh	25,449	27,879	26,372	35,025	49,830	53,792	41,263	43,375	43,516	47,802	46,256
		(9.55)	(-5.41)	(32.81)	(42.27)	(7.95)	(-23.29)	(5.12)	(0.33)	(9.85)	(-3.23)
West Bengal	14,206	15,362	16,304	16,794	18,186	21,570	18,673	17,999	17,741	17,557	18,507
		(8.14)	(6.13)	(3.01)	(8.29)	(18.61)	(-13.43)	(-3.61)	(-1.43)	(-1.04)	(5.41)
Total	217,781	229,043	254,116	269,126	312,692	326,372	308,729	324,346	329,181	338,758	369,601
		(5.17)	(10.95)	(5.91)	(16.19)	(4.38)	(-5.41)	(5.06)	(1.49)	(2.91)	(9.10)
Total (All States & UTs)	229,332	241,647	268,226	283,200	328,868	343,367	325,229	341,228	345,636	358,955	392,327
		(5.37)	(11.00)	(5.58)	(16.13)	(4.41)	(-5.28)	(4.92)	(1.29)	(3.85)	(9.30)
Centre (Total)	1,588	2,081	12,325	12,809	10,695	10,031	10,951	12,218	14,606	16,274	39,591
		(31.04)	(492.12)	(3.93)	(-16.51)	(-6.21)	(9.18)	(11.57)	(19.55)	(11.42)	(143.28)
Grand Total	236,757	243,728	280,550	296,009	339,563	353,398	336,180	353,446	360,242	375,228	431,918
		(2.94)	(15.11)	(5.51)	(14.71)	(4.07)	(-4.87)	(5.14)	(1.92)	(4.16)	(15.11)

Source: Government of India, 1995. Figures for 1994-95 and 1995-96 have been taken from Analysis of Budgeted Expenditure on Education, 1994-94 to 1996-97. The figures available have been converted to constant prices with 1980-81 as the base year. Figures in brackets show the percentage increase over the previous year.

Table 46: Avearge annual growth rate in expenditure on elementary education				
State	Pre-reforms Period	Reform Period		The entire period 1985-86 to 1993-94
	1985-86 to 1990-91	1990-91 to 1993-94	1990-91 to 1995-96	
Orissa	13.36	7.05	7.91	10.95
Himachal Pradesh	12.68	5.32	1.82	9.86
Karnataka	6.54	10.75	4.54	8.10
Uttar Pradesh	16.15	-6.82	-2.97	6.94
Rajasthan	10.70	-0.09	5.56	6.53
Madhya Pradesh	8.73	2.07	4.30	6.18
Haryana	9.39	0.70	4.27	6.05
Assam	5.95	5.78	8.00	5.89
Tamil Nadu	8.67	1.37	1.68	5.87
Bihar	9.66	-2.45	-0.37	4.95
Punjab	6.11	2.47	0.45	4.73
Maharashtra	5.03	1.71	7.69	3.77
Andhra Pradesh	4.40	1.77	0.20	3.40
West Bengal	8.71	-6.31	-3.02	2.82
Kerala	4.78	-0.40	4.14	2.81
Gujarat	2.36	2.84	5.11	2.54
Total	8.43	0.29	2.52	5.30
Total (All States & UTs)	8.41	0.22	2.70	5.26
Centre (Total)	44.57	13.34	31.60	31.96
Grand Total	8.34	0.64	4.09	5.39
Calculated from Table 45 above as a geometric mean of annual growth rates.				

Table 47 presents four indicators, namely, enrolment ratio and dropout rate for the educational achievements and teacher-pupil ratio along with the number of schools per 100 sq. Km. for the level and quality of educational services. However, we were unable to find any relationship between the rate of growth expenditure and the educational achievements of the state during the reforms period. For example, if we compare the rate of growth in expenditure during the period 1990-91 to 1993-94 with the difference in enrolment ratio between 1992 and 1996, we find that Kerala with a negative growth rate in expenditure experienced a tremendous increase in the enrolment ratio whereas Orissa, Gujarat and Andhra Pradesh even with a positive rate of growth in expenditure experienced a decline in the enrolment ratio. Even if we include 1994-95 and 1995-96 on the expenditure side the story does not change much since Gujarat and Madhya Pradesh show a higher rate of growth in expenditure than Kerala. Similar results are found in the case of dropout rate where Assam Gujarat and Punjab experienced an increase despite a positive rate of growth of expenditure

while Uttar Pradesh and West Bengal experienced a decline despite a negative rate of growth of expenditure. Similarly when we look at the level of services we find that Orissa with a very high rate of growth of expenditure shows no improvement in the level of services while states like Haryana and Uttar Pradesh with much lower or even negative rates of growth in expenditure show a substantial improvement.

Table 47: Educational Attainment and Quality of services

	Enrolment ratio		Dropout rate		Teacher-Pupil ratio		No. of elementary schools per 100 sq. km.	
State	1992	1996	1992*	1996	1992	1996	1992	1996
Andhra Pradesh	72.8	69.6	75.94	62.82	65	52	20.6	20.6
Assam	81.3	96.3	69.22	70.96	40	36	44.1	47.7
Bihar	60.7	59.0	78.61	79.07	54	48	38.4	38.8
Gujarat	100.8	96.5	58.36	59.39	44	42	16.4	17.1
Haryana	39.9	73.1	35.56	23.91	88	43	14.3	16.5
Himachal Pradesh	85.8	89.0	19.61	15.77	39	31	15.5	15.8
Karnataka	89.1	89.8	61.09	60.96	46	52	21.0	21.6
Kerala	63.8	92.0	2.4	1.96	48	32	25.0	25.0
Madhya Pradesh	89.0	85.0	53.52	44.68	41	41	19.0	22.1
Maharashtra	82.6	100.8	51.21	47.38	49	39	20.0	20.5
Orissa	88.8	77.3	69.24	61.21	35	35	34.0	34.8
Punjab	64.1	74.2	45.37	46.44	55	37	27.6	30.1
Rajasthan	67.2	81.0	81.88	64.77	47	40	11.9	13.6
Tamil Nadu	95.3	100.6	38.85	34.74	57	47	27.5	27.8
Uttar Pradesh	69.4	65.1	48.39	37.93	60	53	32.0	37.7
West Bengal	124.3	97.9	74.29	46.67	76	70	62.0	61.0
Total	80.1	80.8			52	46	24.2	25.8
All India	79.0	80.7	61.1	52.74	51	45	22.1	23.6

Source: calculated from Govt. of India, 1993 and 1997b.
* Govt. of India, 1998b.

A variety of reasons may explain the results. One important factor is the demand side that may have much greater impact on the outcome than the supply side (MIMAP-India survey results). Secondly the efficiency of expenditure may be different across states. Thus, while we concentrate merely at the teacher-pupil ratio, what may remain hidden is the quality of teachers themselves. For example, in 1992 Tamil Nadu showed a much better performance than Bihar in terms of enrolment and literacy in rural areas even though Bihar had a higher percentage of qualified primary school teachers and primary schools within habitation. But when we take "*trained* matriculate and above" for teacher we find the figures to be 26 per

cent for Bihar and 51 per cent for Tamil Nadu. Similarly, when we consider that only 30 per cent of rural primary schools in Bihar had usable blackboards while in Tamil Nadu 75 per cent of rural primary schools had usable blackboards, we find the reason for this apparent paradox (Pal and Pant, 1995). Thirdly indicators like enrolment ratio and dropout rate are also dependent on the rate of growth of population. If the rate of growth of population is low even a low rate of growth of expenditure may influence the outcome much more substantially as seen in the case of Kerala and Tamil Nadu.

Keeping in mind the above factors, a more relevant analysis may be to relate the final outcome in the year 1996 with the expenditure incurred by the state governments per child in the past few years. The results have been presented in the table 48. Even here we do not find a very high correlation between enrolment rate and public expenditure per child. Again the demand side and the efficiency of expenditure become the important variables that would help the transformation of expenditure into a better outcome. The correlation with dropout rate is higher suggesting that public expenditure has a much higher impact on retaining children at school rather than bringing about greater enrolment. The impact on teacher-pupil ratio is the highest. The negative value is to be expected as the teacher-pupil ratio shows the number of students per teacher that would be expected to decline with greater expenditure. Thus, public expenditure has a higher impact on improving the quality of services. However, so far as infrastructure in terms of number of schools per 100 sq. km. is concerned we find a small but negative correlation with expenditure. This is much more difficult to explain but it may be argued that the linkage is reverse; the states with limited educational infrastructure are spending more in order to overcome the limitations of infrastructure and to catch up with the more advanced states.

Thus, merely the public expenditure on education does not explain the differences across states in educational achievements. While it does tend to explain the differences in the quality of education to some extent, it does not explain the educational achievements to the same extent. There is a need to look at the demand side and to analyse whether the public and private expenditures on education are complementary. Also an important feature of state financing is the proportion of spending that goes to elementary education.

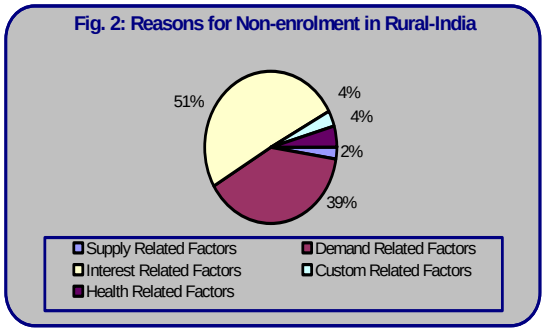
With increasing recognition of the role of education in development broadening of educational opportunities has been given due importance (at least in rhetoric) since Independence. But in contrast to the policy, the target of free and compulsory education for all children below 14 years of age, which was fixed in 1950 to be attained by 1960, is yet to be fulfilled till date. Although there has been progress, the current levels of elementary enrolment continue to be low (Table 49). The fact that the enrolment rates are lower for the Below poverty line households as against the Above poverty line households and that they are lower for rural areas as compared to urban areas lays further emphasis on the role of the state in tackling the problem. The state needs to take care of the special problems that the vulnerable groups may face in order to improve the educational status of the population.

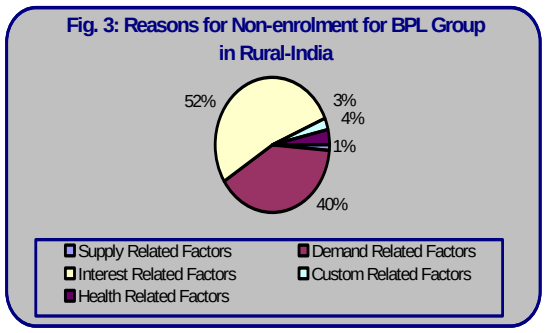
Table 48: Correlation between per child expenditure and educational attainment

State	Average expenditure per child 1985-86 to 1993-94	enrolment 1996	Dropout rate 1996	Teacher - Pupil ratio 1996	No. of elementary schools per 100 sq. km. 1996
Andhra Pradesh	128.8	69.6	62.82	52	20.6
Assam	205.8	96.3	70.96	36	47.7
Bihar	137.4	59.0	79.07	48	38.8
Gujarat	215.6	96.5	59.39	42	17.1
Haryana	149.7	73.1	23.91	43	16.5
Himachal Pradesh	360.8	89.0	15.77	31	15.8
Karnataka	182.1	89.8	60.96	52	21.6
Kerala	303.4	92.0	1.96	32	25.0
Madhya Pradesh	137.5	85.0	44.68	41	22.1
Maharashtra	186.0	100.8	47.38	39	20.5
Orissa	157.0	77.3	61.21	35	34.8
Punjab	161.5	74.2	46.44	37	30.1
Rajasthan	149.2	81.0	64.77	40	13.6
Tamil Nadu	213.5	100.6	34.74	47	27.8
Uttar Pradesh	117.8	65.1	37.93	53	37.7
West Bengal	114.4	97.9	46.67	70	61.0
Total	156.8	80.8		46	25.8
All India	165.0	80.7	52.74	45	23.6
Correlation		**0.46 (10%)**	**-0.58 (2%)**	**-0.63 (1%)**	**-0.34**

* Average expenditure for 1985-86 to 1993-94 has been divided by child population in 1991.

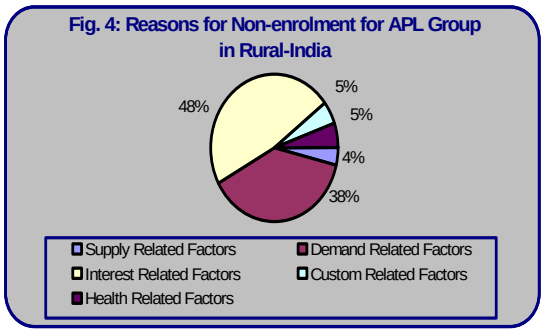
Table 49: Elementary Enrolment Rates (%) and Gender Disparity by Place of Residence and Poverty Category		
Place of Residence	Persons	f/m
All-India	76.2	0.90
BPL	65.6	0.82
APL	84.8	0.95
Rural-India	73.2	0.88
BPL	63.8	0.81
APL	81.1	0.93
Urban-India	86.7	0.94
BPL	72.4	0.85
APL	96.4	0.99

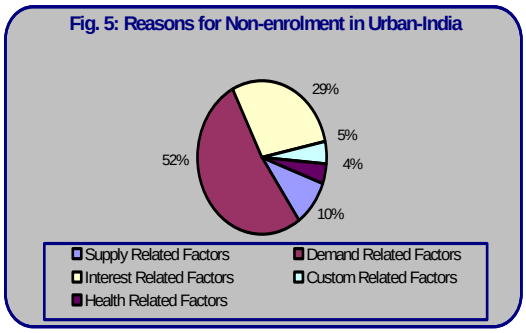




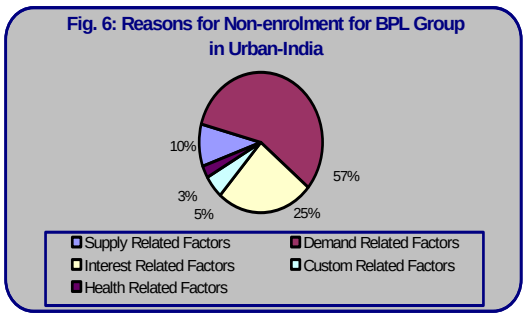
These factors in combination with the above analysis that shows that there is more to educational attainment then merely public supply of education, it is necessary to look at the causes of non-enrolment as investigated by the MIMAP-India Survey. In the case of rural areas the household response (Figure 2) shows that the major reasons for non-enrolment are unconstrained demand (interest related factors being 51 per cent) and constrained demand (economic factors accounting for 39 per cent). The NSSO results of the 35th round for 1980-81 also confirmed these two as important factors for non-enrolment. This re-establishes that demand reasons, and more so the interest related factors rather than economic factors, are more important than other reasons in explaining non-enrolment and dropouts in India. Supply related factors such as 'school too far', 'school dysfunctional', 'teacher's attitude discouraging' account for only 2 per cent. Similarly, custom and health related factors each account for only 4 per cent. As compared to the APL group (48 per cent), a larger percentage (52) of the population in the BPL category (Figures 3 and 4), attribute their non-enrolment to unconstrained demand (interest related factors). However, constrained demand is the next prominent reason of non-enrolment for both APL and BPL categories of population, although the degree is lesser for the former (38 per cent) than the latter category (40 per cent). The

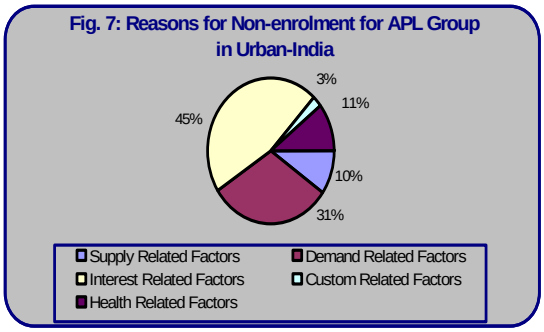
state has to deal with the interest related factors in more innovative ways; merely an increase in state funding of education may not be able to take care of it. This seems to be one of the primary reasons why we do not find a close linkage between state expenditure and educational attainment. Hence, in rural areas, the major reason for non-enrolment is unconstrained demand, which negates the popular perception that poverty or financial constraint is the major factor for poor households.





In urban areas, however, constrained demand (52 per cent) is the major reason for non-enrolment (Figure 5). But, a contrast is observed between the poor and non-poor within urban areas. While constrained demand (57 per cent) is the major reason for non-enrolment of the poor (Figure 6), unconstrained demand (45 per cent) is the major reason for non-enrolment of the non-poor (Figure 7). Thus, based on the above data, among the reasons for non-enrolment of various groups of population on the basis of place of residence and the level of poverty the primacy of demand factors (either unconstrained or constrained) is established beyond any doubt. On the contrary, supply, custom and health related factors, which are no doubt important, rank lower as reasons of non-enrolment stated by the respondents of MIMAP-India Survey.





This does not imply that the state has no role to play in expanding the educational base. What it implies is that government spending on education has to be accompanied by other programmes to address non-monetary constraints that individuals face in their decision to attend school (Inchauste, 2000). The public expenditure has to be directed towards inducing

the demand for elementary education. For example, improvement in supply of better quality schools may be demand inducing. The linkage between education and employment opportunities has to be made stronger and needs to be clearly perceived by the population. Besides, custom and health related factors might also be a cause of lack of interest that can be taken care of by the state. In the case of the poor the state can also bring about a change by ameliorating the economic constraints, particularly in the urban areas.

At this stage it may also be worthwhile to examine the linkage between public expenditure and private expenditure on elementary education. Does a higher spending by the government bring forth a higher spending by the households? The correlation between the two turns out to be very small suggesting that the linkage between public and private expenditure on elementary education is small (Table 50).

In fact private expenditure on education is determined to a very high extent by the per capita income state domestic product. A much higher level of correlation is observed between the private expenditure per student and the state domestic product per capita (Table 51) thus suggesting that economic factors do play a role in higher demand for education. The relationship may be indirect through the perception of increased opportunity to exploit the employment potential.

The constraints on education may be divided into resources, values, incentives and institutions (Dreze & Saran, 1993). A higher level of general education in a state is likely to strengthen the institutional mechanism to demand more resources and better quality of education from the state, thus, creating a positive impact on all the above factors mentioned by Dreze and Saran. The correlation between literacy rate existing in 1991 and public expenditure per child comes out to be fairly high (Table 51). Private expenditure on education too is positively associated with the literacy rate existing in 1991 suggesting that a higher level of education has a positive influence on the demand side, possibly by reinforcing the positive attitude towards education. The quality of education too influences the demand for education. Good quality education provides greater incentive to acquire education.

Table 50: Ranking of states in descending order by expenditure per child			
States ranked by Public Expenditure per child on elementary education	Public Expenditure per child (Average for 1993-94 to 1995-96)*	States ranked by Private Expenditure per student on primary education	Private Expenditure per student (1995-96)**
Himachal Pradesh	1344	Punjab	1162
Kerala	1209	Haryana	953
Gujarat	917	Kerala	725
Assam	871	Himachal Pradesh	573
Tamil Nadu	846	Maharashtra	540
Rajasthan	701	Rajasthan	518
Karnataka	701	Uttar Pradesh	507
Maharashtra	697	Tamil Nadu	464
Orissa	654	West Bengal	433
Haryana	605	Andhra Pradesh	430
Madhya Pradesh	557	Gujarat	423
Punjab	545	Madhya Pradesh	333
Bihar	474	Bihar	330
Andhra Pradesh	446	Karnataka	294
Uttar Pradesh	431	Orissa	284
West Bengal	376	Assam	251
Simple correlation between public and private expenditure = 0.06			
Source: * Govt. of India, 1993 & 1998a (Average public expenditure for the period has been divided by the estimated child population in Sep., 1993). ** NSSO, 1998.			

At present we look at the inter-state differences in public expenditure per child which has been arrived at by taking an average of expenditure at constant prices (base 1993-94) for the years 1993-94 to 1995-96 and dividing it by the 6-14 year child population on September 30, 1993 (Table 52). The highest spender comes out to be Himachal Pradesh while the lowest spender is West Bengal. Table 50 ranks the states in descending order in terms of expenditure per child. The average spending for all India (centre, states and UTs combined) comes out to be Rs. 654 (Table 52). Of the 16 major states considered here, 7 states had expenditure less than this. Orissa is just at the average when expenditure by the centre is included and slightly above average when only the combined average for states and UTs is considered. The worst performers turn out to be West Bengal, Uttar Pradesh, Andhra Pradesh and Bihar in that order. The best performers turn out to be Himachal Pradesh, Kerala, Gujarat, Assam and Tamil Nadu, in descending order.

Table 51: Factors explaining higher private expenditure		
State	Per capita net state domestic product at current prices 1995-95**	Literacy rate 1991**
Andhra Pradesh	9274	44.09
Assam	6624	52.89
Bihar	3533	38.48
Gujarat	12914	61.29
Haryana	13573	55.85
Himachal Pradesh	8747	63.86
Karnataka	9359	56.04
Kerala	9004	89.81
Madhya Pradesh	6775	44.2
Maharashtra	15770	64.87
Orissa	6236	49.09
Punjab	16053	58.51
Rajasthan	7523	38.55
Tamil Nadu	10222	62.66
Uttar Pradesh	5872	41.6
West Bengal	8491	57.7
Correlation with average private expenditure per student (primary)*	0.67	0.36
Correlation with average public expenditure per child (elementary)*	0.10	0.68
Source: * Same as Table 50 above ** Economic Survey, 1999-2000.		

It must be noted here that Kerala and Himachal Pradesh show the lowest dropout rates and the best teacher-pupil ratio in 1996, the two indicators that our analysis showed are affected most by public expenditure. An interesting case is that of Rajasthan which is often clubbed together with Uttar Pradesh and Bihar. Rajasthan features among the higher than average spenders on elementary education. Figure 8 shows the percentage of total (Plan + Non-Plan) Budgeted Revenue Expenditure that goes to elementary education for the worst performers mentioned above. Bihar does provide a large share to elementary education while it has gone up for Uttar Pradesh but it has been declining for Andhra Pradesh and West Bengal. There seems to be an effort being made by the states of Bihar and Uttar Pradesh to take care of elementary education. Figure 9 presents the share of elementary education on Revenue Account in the total Budgeted expenditure on education for the better performing states. Orissa that has come closest to the all-India average has put in a higher share for

elementary education. Gujarat shows an increasing trend in general. Himachal Pradesh has maintained a more than 50% share of elementary education. Kerala and Tamil Nadu show almost the same levels of share of elementary education that is tending towards the 50 percent level. Thus in the reforms period there seems to be greater stress being placed by the low performing states on basic education in terms of the allocation to elementary education.

Table 52: State-wise per child expenditure on elementary education (Revenue Account)

State	1993-94 (Ac) (1)	1994-95 (Ac) (2)	1995-96 (RE) (3)	Average (4) (1)+(2)+(3)/3	Estd. Child (6-14 yrs.) pop. (sept. 1993) (5)	Expenditure per child (4)*1000/(5)
Andhra Pradesh	6050370	6604204.63	6245592.72	6300056	14119639	446
Assam	4750279	3710897.53	4986836.42	4482671	5146446	871
Bihar	8994906	9667904.01	10032529.1	9565113	20171532	474
Gujarat	7317490	7671446.84	8141958.11	7710298	8403606	917
Haryana	2053233	2184207.79	2439570.4	2225670	3679408	605
Himachal Pradesh	1343524	1354502.64	1541671.83	1413233	1051348	**1344**
Karnataka	6510997	6551677.97	6924410.3	6662362	9505225	701
Kerala	5247841	5978939.14	6649912.3	5958897	4930185	1209
Madhya Pradesh	7386173	7467341.82	8727328.93	7860281	14113812	557
Maharashtra	11634269	11528893.1	13598885.1	12254016	17586473	697
Orissa	3882117	4069260.8	4865281.09	4272220	6530144	654
Punjab	2174166	2066642.05	2258773.82	2166527	3973183	545
Rajasthan	6461951	7234913.96	7727893.87	7141586	10181967	701
Tamil Nadu	8087916	8108700.21	9229551.55	8475389	10017598	846
Uttar Pradesh	11167622	14721577.1	14167778.9	13352326	31005980	431
West Bengal	5598503	5407146.63	5668461.24	5558037	14769550	**376**
Total	98661357	104328256	113206436	105398683	175186096	602
Total (All States & UTs)	104321053	110548229	120167464	111678915	181387168	616
Centre (Total)	3896968	5011841.25	12126452.2	7011754		
Grand Total	108218021	115560070	132293916	118690669		654

Source: Govt. of India, 1997b & 1998a.

The importance of public expenditure cannot be gainsaid, particularly in retention of children in school and improving the quality of services. While it may not directly influence private expenditure on education it certainly does have an effect. Literacy rates as well as state domestic product were seen to have a positive influence on education. A higher level of education is seen to positively influence expenditure on education and may influence the government to improve the quality of services. The state needs to take care of factors that influence demand for education.

Figure 8: Percentage Share of ElementaryEducation in Total Revenue Expenditure on Education for the bad performers

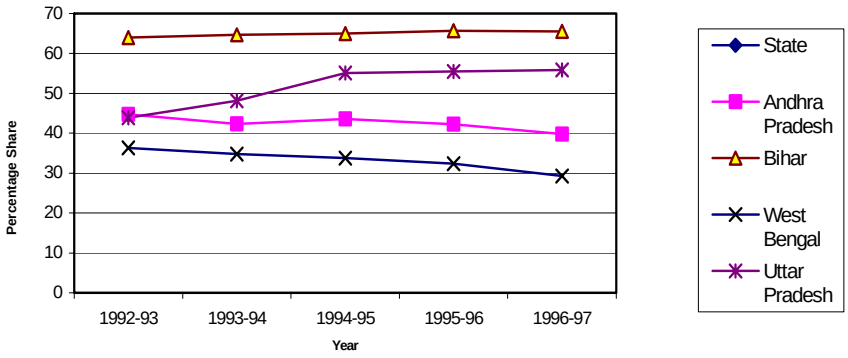
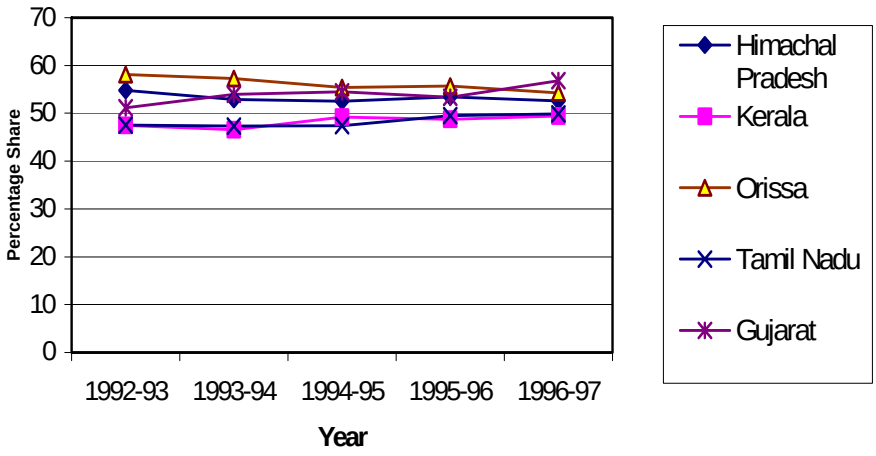


Figure 9: Percentage Share of Elementary Education in Total Revenue Expenditure on Education for good performers



The reforms brought a break in the growth rate of public expenditure on elementary education from which not all the states could recover. What is important is that the laggards in terms of educational achievements seem to be spending more on elementary education in order to correct the historical anomaly. This is an encouraging sign.

VII. REGRESSION RESULTS

A number of regression equations were estimated in order to get a clearer picture of the inter-linkages between income, education and health. However, the results were not very encouraging due to very low value of adjusted R-square in many equations that were estimated. It may be noted that there are a variety of factors that decide an individual's earnings and so a low value of correlation between years of schooling and income is not so

surprising (Mincer, 1974). Only those regression results are being included where the adjusted R-squared had a value of more than 0.15 (Table 53). The equations we have estimated make some very restrictive assumptions. Education of head or average years of schooling of earning members have been taken as independent variables to explain household income. Rates of return to education have been assumed to be constant across different years of schooling as well as across different sectors in which individuals may be employed. Also the earning members have been restricted to above 15 years of age. This is likely to be a very restrictive assumption in the case of India which has such a large population of child labourers. Despite these highly restrictive assumptions the variables education and age explain more than 15 percent of composite household income inequality. Education and experience explain variations in income across households to a much greater extent among salaried households than for other categories (Table 53A). What is interesting is that the coefficient of square of age term comes out to be positive which suggests that the returns are higher at higher age. This could imply two things: (i) there are increasing returns to experience; (ii) post-school investments may generate higher returns at higher age. Most of the estimated coefficients are significant at five-percent significance level, which is likely to be due to large sample size.

For All India level, we get the signs that would be expected when we regress income on education and health indicators. The co-efficient of education is positive and of the variable average number of days earning members were not able to go to work due to illness is negative. Thus, education has a substantial effect on income and bad health tends to reduce income. The co-efficient of education of head is the highest. The coefficient of average illness of all members is many times lower than the coefficient of inability of earning members to go to work due to illness. Thus, illness of the other members in the family is not as important as the illness of earning members in explaining income. The adjusted R-square improves to 0.22 when we take the average years of schooling of all members above the age of 7 years and the coefficient of average years of schooling is higher than the coefficient of average years of schooling of earning members. This suggests that there might be externalities associated with educational level of the household. Since for earning members we have taken only those who are more than 15 years of age, it may also be a reflection of a high magnitude of child workers below the age of 15 years. But what can be concluded is that for child workers also the returns to education are positive. When we consider the average years of schooling of non-earning members in the age group 5-35 years we find a much

higher value for the coefficient of education of head than for income suggesting that income is less important in explaining the education of the young than the educational level of the elders in the family.

In rural areas only one relationship comes out to be significant in terms of adjusted R-squared and that is the dependence of educational level of the young on the education of head and income. In urban areas the coefficient of education of head and square of age (used as a proxy for experience) is much higher than for all India suggesting greater returns to education and experience in urban areas. This may also have a lot to do with the nature of work in urban areas that may also result in employer preference for more educated and experienced workers. The negative value of the constant term may be a reflection of a higher cost of living in urban areas. When we consider the education of young, we find a higher value of the constant term than in rural areas and for all India that might again be linked to the externalities associated with a higher average educational level of the urban population. For above poverty line households we find a positive link between household size and income. When we include education of head in the equation we find a much higher negative coefficient for this term. We had seen in Section II that the household size initially increases with the education of the head and then falls. We find it coming out very clearly here. What emerges very clearly is that education of head has a substantial positive effect on education of the young (more than income) and a negative effect on household size. Any government policy directed towards control of population growth must take this into account, particularly in a scenario of rising incomes. However, for below poverty line households we do not

Table 53: Regression Results

A
Equation: $I_i = \alpha i + Edu\_Hi + Sage\_hi$

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Education of head (Edu_h)*	*Square of age of head (Sage_h)*	adj-R^2	N
All India	4418.561 (3.904)	7883.014 (32.748)	6.935553 (13.602)	0.1866	4856
Urban India	-1710.966 (-0.446)	9625.579 (15.417)	14.5244 (9.689)	0.1532	1492
BPL Households	8195.111 (5.318)	7960.849 (26.531)	7.391827 (11.326)	0.1623	3742
Salaried	3209.863 (1.126)	7664.817 (16.916)	15.1472 (13.984)	0.1954	1466

B

Equation: $I_i = \alpha_i + Edu\_h_i + Sage\_h_i + Adaynw*_i$

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Edu_h*	*Sage_h*	*Adaysnw**	adj-R2	n
All India	4608.934 (4.060)	7862.203 (32.645)	6.989675 (13.695)	-383.7163 (-2.085)	0.1871	4856
Urban India	-1380.259 (-0.361)	9508.249 (15.244)	15.24115 (10.074)	-1284.259 (-3.065)	0.1579	1492
BPL Households	8501.717 (5.504)	7927.225 (26.413)	7.484546 (11.459)	-597.6924 (-2.564)	0.1636	3742
Salaried	3404.298 (1.187)	7651.856 (16.866)	15.11244 (13.931)	-292.4677 (-0.629)	0.1951	1466

C

Equation: Ii = αi + Edu_emi + Sage_emi

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Average years of schooling of earning members (Edu_em)*	*Square of average age of earning members (Sage_em)*	adj-R^2	n
All India	16786.65 (18.164)	3376.464 (33.189)	.910722 (1.170)	0.1849	4856
BPL Households	21690.39 (16.953)	3385.019 (26.159)	.1481138 (0.152)	0.1556	3742

D

Equation: $I_i = \alpha_i + Edu\_em_i + Sage\_em_i + Adaynw_i$

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Edu_em*	*Sage_em*	*Adaysnw*	adj-R2	n
All India	16866.72 (18.206)	3370.216 (33.088)	1.01288 (1.293)	-227.1308 (-1.227)	0.1850	4856
BPL Households	21849.84 (17.032)	3373.192 (26.032)	.3115465 (0.319)	-381.7941 (-1.623)	0.1560	3742

E

Equation: Ii = αi + Ayr_7i + Sage_7i

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Average years of schooling (7+ age group) (Ayr_7)*	*Square of average age (7+ age) (Sage_7)*	adj-R^2	n
All India	11696.05 (11.597)	4910.381 (37.371)	2.013417 (3.288)	0.2244	4856
Urban India	8994.985 (2.715)	5548.92 (15.930)	6.555192 (3.968)	0.1581	1492
BPL Households	16983.9 (12.052)	4862.126 (29.257)	0.8656815 (1.173)	0.1860	3742
Salaried	11125.07 (4.404)	4535.191 (17.178)	9.206534 (6.094)	0.1987	1466

F

Equation: $I_i = \alpha_i + Ayr\_7_i + Sage\_7_i + Ailldays**_i$

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Ayr_7*	*Sage_7*	*Ailldays***	adj-R2	n
All India	11696.08 (11.596)	4910.467 (37.366)	2.019103 (3.268)	-1.705754 (-0.070)	0.2243	4856
Urban India	9011.891 (2.719)	5541.578 (15.893)	6.715864 (4.001)	-34.81506 (-0.544)	0.1577	1492
BPL Households	16980.33 (12.047)	4861.702 (29.249)	.8465818 (1.138)	6.876968 (0.203)	0.1858	3742
Salaried	11121.61 (4.402)	4531.554 (17.151)	9.307254 (6.086)	-21.22733 (-0.431)	0.1982	1466

G

Equation: Ayr_nemi = αi + Edu_hi + Ii

Dependent Variable	**Independent Variable**				
Average years of schooling of non-earning members (5-35 years) (Ayr_nem)	*Constant*	*Education of head*	*Income (I)*	adj-R^2	n
All India	1.013358 (11.890)	.7383117 (29.166)	.0000182 (13.070)	0.2438	4856
Rural India	.918487 (9.244)	.5789096 (17.957)	.0000261 (11.618)	0.1497	3364
Urban India	2.346736 (9.912)	.7110842 (14.332)	8.68e-06 (4.420)	0.1642	1492
APL Households	.1003404 (0.578)	.593805 (12.301)	.0000613 (7.339)	0.1829	1114
BPL Households	1.375796 (12.377)	.733827 (24.799)	.0000146 (9.603)	0.2136	3742

H

Equation (i): Hhsi = αi + Ii

Equation (ii): Hhsi = αi + Ii + Edu_hi

Dependent Variable	**Independent Variable**				
Household Size (Hhs)	*Constant*	*Income*	*Education of head*	adj-R^2	n
APL Households					
Equation (i)	3.946989 (29.619)	0.0001442 (20.883)	-	0.2811	1114
Equation (ii)	4.238452 (29.224)	0.0001509 (21.634)	-.1950826 (-4.839)	0.2953	1114

Note: Figures in brackets are the t-values.

Variable list:

I = Income of the household

Edu_h = Education of head (years of schooling)

Sage_h = Square of age of head

*Adaysnw = Average number of days earning members were not able to go to work due to illness.

Edu_em = Average years of schooling of earning members

Sage_em = Square of average age of earning members

Ayr_7 = Average years of schooling (7+ age group)

Sage_7 = Square of average age of members of the household in 7+ age-group

**Ailldays = Average number of days all household members were ill.

Ayr_nem = Average years of schooling of non-earning members (5-35 years)

Hhs = Household Size

find the negative effect of education of head on household size. This brings us back to our earlier conclusion that the attitude towards family size may be linked much more to the average educational level of society in which we interact.

The Regional Dimension

India presents a vast diversity across regions, particularly in the area of achievements related to social sector. Given these regional diversities, any study that does not account for the experiences at a sufficiently disaggregated level would be incomplete. Hence, we have incorporated the regional dimension in the regression equations. Regions have been defined on the basis of geographical contiguity as well as similarity in achievements in the social field. Accordingly, the seventeen states covered in the survey have been classified into five regions as given below:

(a) North, which includes Haryana, Himachal Pradesh, Punjab and Delhi;

(b) Central, which includes Madhya Pradesh, Rajasthan and Uttar Pradesh;

(c) East, which comprises of Bihar, Orissa, West Bengal and Assam;

(d) West, which includes Gujarat and Maharashtra;

(e) South, comprising of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.

The Southern states have shown a much better performance in terms of achievements related to education and health than the rest of India. Rajasthan has been included in Central instead of West because its achievements in social field are much closer to Madhya Pradesh and Uttar Pradesh rather than Gujarat and Maharashtra. In the following tables, the notations used are the same as in Table 53.

All Households

Table 54: Regional Regression Results

A

Equation: Ii = αi + Edu_Hi + Sage_hi

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Edu_h*	*Sage_h*	adj-R^2	N
North	6575.203 (1.943)	7984.163 (13.427)	12.77546 (9.783)	0.2209	767
Central	3325.188 (1.635)	7765.441 (14.710)	6.144325 (6.456)	0.1476	1293
East	6418.823 (3.509)	6278.358 (16.304)	4.579312 (4.81)	0.1968	1097
West	17633.27 (5.076)	6447.872 (9.077)	3.811946 (2.661)	0.1007	719
South	171.5006 (0.064)	9398.344 (17.117)	8.36072 (7.024)	0.2369	980

B

Equation: $I_i = \alpha_i + Ayr\_7_i + Sage\_7_i$ + Aillday

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Ayr_7*	*Sage_7*	*Aillday***	adj-R2	n
North	19012.99 (6.171)	5258.4 (15.198)	2.58 (1.505)	-1035.682 (-1.790)	0.2311	767
Central	12401.45 (6.27)	5052.446 (17.131)	0.967 (0.701)	-57.635 (-0.574)	0.1838	1293
East	13437.56 (8.14)	4083.301 (18.637)	-0.1183 (0.098)	-65.066 (1.121)	0.2397	1097
West	23668.08 (7.841)	3978.801 (10.329)	-0.262 (0.185)	-141.223 (1.529)	0.1309	719
South	4107.78 (0.107)	5605.18 (18.76)	4.675 (3.382)	33.81 (0.975)	0.2671	980

C

Equation: Ayr_nemi = αi + Edu_hi + Ii

Dependent Variable	**Independent Variable**				
Average years of schooling of non-earning members (5-35 years) (Ayr_nem)	*Constant*	*Education of head*	*Income (I)*	adj-R^2	n
North	1.637 (5.918)	0.626 (9.957)	0.00002 (7.208)	0.2301	767
Central	0.655 (4.840)	0.732 (15.977)	0.000015 (6.567)	0.2457	1293
East	0.6104 (3.645)	0.7769 (15.911)	0.000025 (7.103)	0.3074	1097
West	1.7943 (6.816)	0.5428 (7.507)	0.0000109 (2.887)	0.1049	719
South	1.542 (7.434)	0.7486 (12.185)	0.0000173 (12.185)	0.2309	980

D Equation: Hhsi = αi + Ii + Edu_hi					
Dependent Variable	**Independent Variable**				
Household Size (Hhs)	*Constant*	*Income*	*Education of head*	adj-R^2	n
North	4.656 (28.29)	0.000025 (12.006)	-0.197 (5.266)	0.1576	767
Central	6.2099 (49.080)	0.0000115 (5.355)	-0.081 (1.888)	0.0202	1293
East	5.1378 (43.503)	0.0000214 (8.739)	-0.1445 (4.196)	0.0638	1097
West	4.8127 (29.962)	0.0000203 (8.810)	-0.1992 (4.515)	0.0994	719
South	5.044 (41.486)	0.0000147 (7.853)	-0.2019 (5.609)	0.0624	980

Education and age, which has been taken as a proxy for experience, explain the variation in household income to a much greater extent in North and South. The linkage is weakest in the case of West. This could be an influence of greater availability of self-employment opportunities in the western states that would not require very high education and hence, education may not explain variations in income to the same extent as in other zones. The coefficient of the education term is highest in the South followed by North and the Central region, suggesting highest returns in these regions. The adjusted R^2 value improves when we look at variations in income based on the average years of schooling of all members and add a health variable (Table 54B). More importantly, the coefficient of square of age term becomes negative for East and West, a result more in keeping with other studies, suggesting a reduced rate of return to education as age increases. The value of the coefficients is however lower than when only the education of the household head was considered. The coefficient of variable representing average illness in the household is negative, suggesting that bad health has a negative impact on income. The average years of schooling of non-earning members in the age group of 5-35 years is explained by the education of head and income of the household to the greatest extent in the East and to the least extent in the West (Table 54C). The value of the constant term is highest for North, West and South. In these areas the role of public policies is likely to be more important than in the case of other regions. In the Central and Eastern region the explanatory power of the education of head and income is highest whereas the value of the constant term is lowest. Overall, the coefficient of income term is very low in all the regions, suggesting that the educational level of the head is more important in determining the education of the young than the income of the household, although the latter does have a positive influence. The household size is determined by the education of the head and the income of the household to the greatest extent in the North, the

linkage being considerably weaker in other regions (Table 54D). The value of the constant term is high and the t-values related to the constant are also very high. Externalities associated with average educational level in the region and public policies are likely to be more important determinants of family size rather than successive level of education of the head. Education of the head does have a negative effect on family size in all the regions while income has a small but positive influence, which we have already noted above.

Rural vis-à-vis Urban Households

In rural areas most of the relationships (Table 55) are weaker than in the case of all households (Table 54). The linkage between education and income is weaker in rural areas. In all the equations presented here, the eastern region shows the highest value of adj-R^2, while the West shows the lowest values. Income inequality is explained to the greatest extent by education in the East and the Central region. Education of the young and household size are likely to be related more to the attitude of the people and public policies, both of which are likely to be influenced by the average level of education in the society. This is seen by a high value of the constant term as compared to the cefficients of income and education of the head (Table 55 C & D). In the central region the coefficient of the education of the head term is positive with respect to household size while it is negative in all other regions (Table 55D). It suggests that the negative effect of education on household size does not come into play in the states of Madhya Pradesh, U. P. and Rajasthan. The value of the constant term is also comparatively very high. There seems to be a preference for bigger families in these states, which may be related to the low level of literacy and average education in these states. This region requires a more active public policy intervention in order to bring about a change in the human development profile of these states. The coefficient of the education of head term has the highest value in the South.

Table 55: Regional Regression Results, Rural Areas

A

Equation: $Ii = \alpha i + Edu\_Hi + Sage\_hi$

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Edu_h*	*Sage_h*	adj-R^2	N
North	19146.78 (6.508)	3198.774 (4.727)	8.3588 (7.161)	0.0977	519
Central	11996.03 (7.116)	3699.136 (7.811)	4.389 (6.070)	0.0733	965
East	13058.73 (10.274)	3493.866 (11.067)	2.235 (3.389)	0.1398	754
West	19858.67 (5.853)	2937.901 (3.359)	2.604 (1.926)	0.0214	472
South	12224.61 (5.693)	5714.044 (9.468)	3.523 (3.703)	0.1284	654

B

Equation: $I_i = \alpha_i + Ayr\_7_i + Sage\_7_i + Ailldays$

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Ayr_7*	*Sage_7*	*Ailldays***	adj-R2	n
North	27331.35 (8.546)	2572.56 (5.510)	1.471 (0.781)	-1116.923 (1.741)	0.0599	519
Central	17892.11 (11.163)	3187.464 (10.829)	-1.024 (0.971)	-25.309 (0.286)	0.1118	965
East	17448.96 (14.617)	2397.064 (12.443)	-0.931 (1.066)	-23.023 (0.604)	0.1701	754
West	26256.08 (8.809)	2113.28 (4.312)	-2.510 (1.754)	-70.738 (0.894)	0.0428	472
South	15798.46 (7.694)	3495.674 (11.247)	0.233 (0.212)	50.526 (1.676)	0.1608	654

C

Equation: $Ayr\_nemi = \alpha i + Edu\_hi + Ii$

Dependent Variable	**Independent Variable**				
Average years of schooling of non-earning members (5-35 years) (Ayr_nem)	*Constant*	*Education of head*	*Income (I)*	adj-R^2	n
North	1.8467 (5.896)	0.431 (5.380)	0.0000272 (5.227)	0.1056	519
Central	0.754 (4.902)	0.525 (9.912)	0.0000208 (5.791)	0.1417	965
East	0.485 (2.354)	0.627 (10.246)	0.000038 (5.695)	0.2131	754
West	1.583 (5.439)	0.457 (4.929)	0.0000118 (2.330)	0.0625	472
South	1.161 (4.559)	0.60 (6.571)	0.0000311 (5.604)	0.1441	654

D Equation: Hhsi = αi + Ii + Edu_hi					
Dependent Variable	**Independent Variable**				
Household Size (Hhs)	*Constant*	*Income*	*Education of head*	adj-R^2	n
North	4.761 (27.181)	0.0000193 (6.626)	-0.0849 (1.896)	0.0771	519
Central	5.532 (33.951)	0.000037 (9.721)	0.0236 (0.421)	0.0925	965
East	4.112 (28.425)	0.0000668 (14.264)	-0.106 (2.461)	0.2177	754
West	4.418 (21.239)	0.0000281 (7.788)	-0.068 (1.030)	0.1107	472
South	4.767 (28.772)	0.0000264 (7.299)	-0.196 (3.298)	0.0739	654

In urban areas (Table 56) the explanatory power of education, experience and health variables with respect to income is substantially higher than in rural areas, except in the case of East (Table 56A & B). This, as has been noted above, may be due to greater availability of opportunities in urban areas to exploit the potential created by education. Even in the case of education of the young (Table 56C), the equations show a better fit in the urban areas than in the rural areas, except again in the case of East. Here, the best fit is found in the case of central region, where the educational level of the head and the income of the household explain almost one-third of inequality in educational level of the young. This, it must be noted, is the region where the failure of public policy in terms of educational attainment has been most marked. Thus, the demand side variables would have the highest impact on educational achievements. The regions that are known for active public policy efforts are the South and the West and these are precisely the regions where the relationship is the weakest. When we look at the determinants of household size (Table 56D), we find the lowest adj-R^2 in the Central and the eastern regions. These regions also have the highest intercept value. For the rest of the regions the value improves for urban areas as compared to rural areas. In these regions demand side variables seem to determine the family size much more. The effect is likely to come about due to greater awareness generated by a higher average level of education as well as better implementation of public policy that influence the demand side. Contrary to our hypothesis, income has a negative effect on family size in South, while education of the head has a positive influence. The reasons for this are not very clear, but as a conjecture one may suggest the emigration of labour, which is known to be very high in Kerala, as one of the influential factors.

Table 56: Regional Regression Results, Urban Areas

A

Equation: $Ii = \alpha i + Edu\_Hi + Sage\_hi$

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Edu_h*	*Sage_h*	adj-R^2	N
North	9034.848 (0.815)	8041.139 (4.845)	17.249 (5.574)	0.1352	248
Central	-7848.151 (1.065)	12227.91 (8.666)	9.368 (2.913)	0.1873	328
East	3240.088 (0.351)	7807.348 (5.536)	11.622 (3.389)	0.0884	343
West	35025.78 (4.404)	5108.333 (3.857)	3.698 (1.160)	0.0498	247
South	-32258.55 (3.394)	13010.42 (8.664)	28.447 (8.402)	0.2511	326

B

Equation: $I_i = \alpha_i + Ayr\_7_i + Sage\_7_i + Ailldays$

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Ayr_7*	*Sage_7*	*Ailldays***	adj-R2	n
North	26410.34 (2.767)	5311.15 (5.887)	1.738 (0.537)	-1856.109 (1.705)	0.1184	248
Central	8306.262 (1.268)	6212.334 (8.136)	3.954 (0.790)	-115.984 (0.458)	0.1766	328
East	13847.86 (1.790)	5361.45 (6.504)	-1.990 (0.525)	-86.240 (0.226)	0.1053	343
West	38613.78 (5.462)	2977.243 (13.872)	1.656 (0.561)	-323.518 (0.991)	0.0629	247
South	-26574.68 (2.981)	7736.681 (7.962)	20.779 (4.894)	-54.491 (0.672)	0.2486	326

C

Equation: $Ayr\_nemi = \alpha i + Edu\_hi + Ii$

Dependent Variable	**Independent Variable**				
Average years of schooling of non-earning members (5-35 years) (Ayr_nem)	*Constant*	*Education of head*	*Income (I)*	adj-R^2	n
North	2.157 (2.497)	0.675 (4.553)	0.0000189 (3.323)	0.1291	248
Central	0.873 (0.372)	0.969 (10.029)	6.47e-06 (1.868)	0.3032	328
East	2.533 (4.308)	0.688 (6.278)	0.0000124 (3.001)	0.1488	343
West	3.329 (5.334)	0.443 (3.427)	1.86e-06 (0.289)	0.0427	247
South	4.542 (7.984)	0.396 (3.516)	8.03e-06 (2.125)	0.0624	326

D Equation: Hhsi = αi + Ii + Edu_hi					
Dependent Variable	**Independent Variable**				
Household Size (Hhs)	*Constant*	*Income*	*Education of head*	adj-R^2	n
North	3.755 (6.971)	0.0000324 (9.139)	-0.175 (1.876)	0.2482	248
Central	6.037 (28.230)	2.11e-06 (1.061)	-0.096 (1.726)	0.0034	328
East	5.554 (17.190)	0.0000103 (4.558)	-0.247 (4.103)	0.0760	343
West	4.875 (15.827)	0.0000179 (5.657)	-0.239 (3.761)	0.1290	247
South	4.754 (18.905)	-0.122 (2.458)	9.90e-06 (5.924)	0.0936	326

Below and Above Poverty Line Households

The linkage between education and income turns out to be weak for the below poverty line households (Table 57A). The sample size is comparatively small for the North and the West. In East we find a more significant relationship between income and education for the below poverty line households. All the coefficients are significant only for the East and the Central region. The relationship is much stronger when we take average years of schooling of all members of the household (Table 57B). This could be because children might be contributing substantially to the household income in the case of below poverty line households. The coefficient of the health variable turns out to be insignificant. In explaining the educational level of the young, the education of the head has greater weight than income of the household, thus suggesting that where the head has more education he would demand more education for the children. Income has a small coefficient but it is significant and positive. Household size is explained to a large extent by income and educational level of the head in the East and the West (Table 57D). Again, as observed above, income has a negative effect on family size in the South while education of the head has a positive effect. In the West too education of the head of the household has a positive effect on family size but the t-value shows that the coefficient is not significant.

Table 57:Regional Regression Results, Below Poverty Line

A

Equation: $Ii = \alpha i + Edu\_Hi + Sage\_hi$

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Edu_h*	*Sage_h*	adj-R^2	N
North	22479.22 (3.154)	-726.517 (0.340)	7.308 (1.967)	0.0710	30
Central	12787.34 (16.527)	1369.843 (5.773)	1.037 (2.969)	0.0525	612
East	10542.94 (9.644)	1564.53 (4.828)	2.529 (4.441)	0.1229	247
West	15161.51 (4.442)	705.213 (0.692)	2.579 (1.612)	0.0103	66
South	13621.54 (8.334)	1207.105 (3.007)	1.808 (1.884)	0.0492	159

B

Equation: $I_i = \alpha_i + Ayr\_7_i + Sage\_7_i + Ailldays$

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Ayr_7*	*Sage_7*	*Ailldays***	adj-R2	n
North	14893.06 (2.032)	5559.565 (3.031)	-4.310 (0.80)	-708.111 (0.292)	0.1774	30
Central	15970.0 (22.070)	1031.184 (7.117)	-1.915 (3.244)	78.613 (1.772)	0.0950	612
East	14898.68 (11.959)	1274.046 (6.120)	-1.818 (1.580)	4.250 (0.071)	0.1351	247
West	17100.72 (5.874)	1618.331 (2.896)	-2.527 (1.123)	-74.034 (0.190)	0.0822	66
South	17757.75 (10.451)	845.436 (3.606)	-2.845 (2.005)	-3.863 (0.273)	0.1093	159

C

Equation: $Ayr\_nemi = \alpha i + Edu\_hi + Ii$

Dependent Variable	**Independent Variable**				
Average years of schooling of non-earning members (5-35 years) (Ayr_nem)	*Constant*	*Education of head*	*Income (I)*	adj-R^2	n
North	0.926 (1.089)	0.392 (1.719)	0.0000433 (2.249)	0.1540	30
Central	0.247 (1.153)	0.582 (9.287)	0.0000383 (3.608)	0.1595	612
East	-0.192 (0.588)	0.568 (6.280)	0.0000657 (3.875)	0.2180	247
West	1.147 (0.992)	0.101 (0.298)	0.000109 (2.555)	0.0672	66
South	0.471 (0.923)	0.714 (5.970)	0.00069 (2.861)	0.2431	159

D Equation: Hhsi = αi + Ii + Edu_hi					
Dependent Variable	**Independent Variable**				
Household Size (Hhs)	*Constant*	*Income*	*Education of head*	adj-R^2	n
North	3.071 (5.824)	0.000195 (16.296)	-0.171 (1.205)	0.9037	30
Central	4.570 (22.688)	0.000146 (14.612)	-0.081 (1.366)	0.2596	612
East	3.279 (14.802)	0.000194 (16.905)	-0.214 (3.492)	0.5360	247
West	3.543 (5.314)	0.000137 (5.596)	0.000609 (0.003)	0.3111	66
South	4.368 (10.453)	-0.368 (3.765)	0.000125 (6.308)	0.2191	159

In the case of above poverty line households (Table 58), the coefficients of education and age are significant in all the cases and the R^2 values are also much higher than observed for the below poverty line households. The equations suggest a higher return to education for above poverty line households than for the below poverty line households. When we do a multivariate analysis by including a health indicator, the values come out to be significant only in the case of South (Table 58B). However, the equation does present a problem, as the sign of the coefficient of variable for average illness in the household is positive. This is likely to be related to the problem of subjectivity of perception that is influenced by the level of education. In explaining the educational level of the young, the coefficient of the education of the head term has a much higher value in the case of above poverty line households as compared to below poverty line households (Table 58C). Also the coefficient of income term is much smaller. Thus, economic factors are less important in determining the demand for education in the case of above poverty line households. A more educated head of the household is likely to demand more education for the young. Education of the head has a negative effect on household size in all the regions while income has a positive effect. Thus, in the case of South, we find different relationships between income and household size and between level of education of the household head and household size across above and below poverty line households. To what extent this may be linked to migration patterns is not immediately clear.

Table 58: Regional Regression Results, Above Poverty Line

A

Equation: Ii = αi + Edu_Hi + Sage_hi

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Edu_h*	*Sage_h*	adj-R^2	N
North	6777.12 (1.918)	8005.384 (13.045)	12.787 (9.514)	0.2166	737
Central	7494.015 (1.786)	8812.544 (10.155)	8.892 (5.191)	0.1358	681
East	9139.803 (3.635)	6390.832 (13.236)	4.634 (3.650)	0.1707	850
West	21352.85 (5.516)	6134.723 (7.998)	3.265 (2.106)	0.0870	653
South	2496.964 (0.765)	9863.557 (15.553)	7.694 (5.705)	0.2300	821

B

Equation: $I_i = \alpha_i + Ayr\_7_i + Sage\_7_i + Ailldays$

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Ayr_7*	*Sage_7*	*Ailldays***	adj-R2	n
North	19729.80 (6.115)	5197.836 (14.582)	2.543 (1.442)	-1056.831 (1.787)	0.2230	737
Central	22963.22 (5.661)	5269.888 (10.717)	-1.266 (0.550)	-125.488 (0.790)	0.1475	681
East	17017.85 (7.649)	4088.581 (14.851)	-1.069 (0.747)	-76.373 (1.131)	0.2045	850
West	27518.32 (8.160)	3796.471 (9.169)	-0.783 (0.522)	-166.086 (1.742)	0.1193	653
South	6637.799 (2.113)	5776.702 (16.686)	3.502 (2.265)	101.535 (2.035)	0.2555	821

C

Equation: Ayr_nemi = αi + Edu_hi + Ii

Dependent Variable	**Independent Variable**				
Average years of schooling of non-earning members (5-35 years) (Ayr_nem)	*Constant*	*Education of head*	*Income (I)*	adj-R^2	n
North	1.689 (5.865)	0.625 (9.668)	0.0000249 (6.914)	0.2238	737
Central	1.161 (4.952)	0.757 (11.535)	9.99e-06 (3.552)	0.2185	681
East	1.018 (4.660)	0.778 (13.546)	0.0000196 (5.182)	0.2707	850
West	1.651 (5.869)	0.583 (7.920)	0.0000102 (2.687)	0.1186	653
South	1.653 (6.703)	0.746 (10.722)	0.0000161 (4.663)	0.2156	821

D Equation: Hhsi = αi + Ii + Edu_hi					
Dependent Variable	**Independent Variable**				
Household Size (Hhs)	*Constant*	*Income*	*Education of head*	adj-R^2	n
North	4.418 (27.638)	0.0000251 (12.568)	-0.162 (4.508)	0.1749	737
Central	5.284 (27.084)	0.0000142 (6.072)	-0.038 (0.696)	0.0511	681
East	4.617 (33.268)	0.0000213 (8.888)	-0.086 (2.368)	0.0848	850
West	4.471 (27.127)	0.0000218 (9.823)	-0.171 (3.958)	0.1282	653
South	4.617 (35.551)	0.0000161 (8.860)	-0.160 (4.370)	0.0855	821

Salaried vis-à-vis Wage Earning Households

In the case of salaried households (Table 59), the coefficients of education and age term come out to be highly significant in explaining variations in income across households (Table 59A). In south almost 30 percent of income inequality may be explained by education of head and his/her experience. The linkage is strong in North and Central region also. However, it again comes out to be low for West, where education and age of head of the household explain only around 6 percent of income inequality. This could again be either because the educational level of the head is not a very good proxy for the educational level of the earning members or because there might be greater availability of self-employment opportunities in the states of Maharashtra and Gujarat, which comprise West. The value of R^2 improves in the case of West and East when we take the average level of education of the family members of the household above the age of 7 years but not very substantially (Table 59B). The coefficient of the term for illness at the household level comes out to be negative but is not significant. The coefficient of the terms education of the head and income of the household are predictably positive in explaining the educational level of the young and the values are significant (Table 59C). Again the linkage is weak in the West and the South. Moreover, the coefficient of the income term is not significant in the West as shown by a very low t-value. The conclusion may be that education of the young is explained less by the demand side variables and more by state policies in these regions. Since the linkage between income and education is weak in the case of West, this may be another reason why the

demand side may be weaker in explaining variations in educational level of the young. When we look at the household size (Table 59D), we find the income and education of the head terms to be significant and they also have the expected signs. The constant term comes out to be highly significant and it is the highest in the Central region. The association is weakest in East.

Table 59:Regional Regression Results, Salaried Households

A

Equation: $Ii = \alpha i + Edu\_Hi + Sage\_hi$

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Edu_h*	*Sage_h*	adj-R^2	N
North	-12357.40 (1.750)	9775.943 (9.065)	23.199 (9.461)	0.2826	317
Central	14496.65 (2.533)	6640.796 (6.791)	10.750 (5.418)	0.1842	243
East	1974.43 (0.501)	6701.303 (11.037)	11.524 (6.031)	0.2695	354
West	28417.68 (4.305)	4841.893 (4.328)	5.776 (2.323)	0.0597	275
South	-25373.99 (3.107)	11621.22 (9.457)	26.706 (9.114)	0.3003	277

B

Equation: $I_i = \alpha_i + Ayr_7_i + Sage_7_i + Aillday$s

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Ayr_7*	*Sage_7*	*Aillday*s**	adj-R2	n
North	2056.793 (0.316)	5786.772 (8.846)	11.994 (2.906)	155.815 (0.140)	0.2378	317
Central	26781.48 (4.538)	3710.991 (6.176)	2.775 (0.631)	-84.802 (0.124)	0.1387	243
East	8446.902 (2.432)	3904.932 (10.682)	8.584 (3.125)	-67.683 (0.373)	0.2934	354
West	31176.57 (5.902)	3254.373 (5.060)	2.860 (1.051)	-489.684 (1.884)	0.0950	275
South	-23565.13 (2.994)	6965.094 (9.497)	22.231 (5.422)	-27.001 (0.375)	0.2960	277

C

Equation: $Ayr\_nemi = \alpha i + Edu\_hi + Ii$

Dependent Variable	**Independent Variable**				
Average years of schooling of non-earning members (5-35 years) (Ayr_nem)	*Constant*	*Education of head*	*Income (I)*	adj-R^2	n
North	2.742 (4.748)	0.619 (5.621)	0.0000177 (3.395)	0.1531	317
Central	1.843 (3.302)	0.650 (5.814)	0.0000192 (2.712)	0.1821	243
East	1.879 (4.113)	0.628 (6.566)	0.0000285 (3.837)	0.2176	354
West	3.487 (5.752)	0.328 (2.692)	3.15e-06 (0.459)	0.0228	275
South	4.580 (7.467)	0.314 (2.702)	0.0000162 (3.059)	0.0739	277

D Equation: Hhsi = αi + Ii + Edu_hi					
Dependent Variable	**Independent Variable**				
Household Size (Hhs)	*Constant*	*Income*	*Education of head*	adj-R^2	n
North	5.564 (17.574)	0.0000247 (8.625)	-0.390 (6.452)	0.2206	317
Central	6.896 (16.589)	0.0000211 (3.991)	-0.378 (4.541)	0.1050	243
East	5.378 (18.449)	0.000019 (4.008)	-0.222 (3.636)	0.0494	354
West	5.549 (19.591)	0.0000177 (5.522)	-0.329 (5.784)	0.1555	275
South	5.531 (15.925)	0.0000161 (5.249)	-0.281 (4.171)	0.1060	277

The returns to education come out to be comparatively much lower in the case of wage earning households (Table 60A). Education of the head of the household explains income inequality to some extent only in the North. This is in keeping with our earlier view that education to be transformed into higher income would require a certain socio-economic background. When we look at the average years of schooling of the young (Table 60C), the value of the constant term comes out to be much lower than in the case of salaried households and are in general not significant. This again suggests that demand for education is determined by the external environment, and is likely to be higher where the external environment is more informed. In general, the association between education of the young, on the one hand, with the education of the head of the household along with income, on the other, comes out to be much lower in the case of wage earning households as compared to salaried households. Variations in household size are explained to a very great extent by variations in income and the effect of income on household size is positive (Table 60D). The coefficient of the term education of the head is significant only in the South and the West and it also bears the expected negative sign. The value of the constant term once again comes out to be highest in the Central region.

Table 60: Regional Regression Results, Wage Earning Households

A

Equation: $Ii = \alpha i + Edu\_Hi + Sage\_hi$

Dependent Variable	**Independent Variable**				
Income	*Constant*	*Edu_h*	*Sage_h*	adj-R^2	N
North	18325.63 (15.039)	1581.018 (4.078)	4.049 (7.145)	0.1928	232
Central	13179.55 (15.985)	1154.537 (4.552)	1.636 (3.778)	0.0497	510
East	12713.93 (12.639)	803.859 (2.009)	1.20 (1.917)	0.0230	244
West	16671.84 (9.964)	1770.497 (3.205)	1.111 (1.512)	0.0413	209
South	13758.52 (9.950)	1449.42 (3.059)	3.527 (5.536)	0.0928	351

B

Equation: $I_i = \alpha_i + Ayr\_7_i + Sage\_7_i + Ailldays$

Dependent Variable	**Independent Variable**					
Income	*Constant*	*Ayr_7*	*Sage_7*	*Ailldays***	adj-R2	n
North	22693.29 (16.001)	1209.505 (4.549)	-0.057 (0.063)	-458.514 (1.624)	0.0912	232
Central	16092.90 (19.325)	926.643 (5.345)	-1.092 (1.648)	79.899 (1.302)	0.0605	510
East	15990.81 (16.163)	603.261 (2.273)	-1.741 (2.143)	40.266 (0.701)	0.0295	244
West	21950.42 (14.488)	628.347 (2.425)	-2.209 (2.591)	210.999 (1.150)	0.0563	209
South	17279.19 (12.939)	1348.919 (6.304)	-0.384 (0.461)	-17.504 (1.0)	0.1037	351

C

Equation: $Ayr\_nemi = \alpha i + Edu\_hi + Ii$

Dependent Variable	**Independent Variable**				
Average years of schooling of non-earning members (5-35 years) (Ayr_nem)	*Constant*	*Education of head*	*Income (I)*	adj-R^2	n
North	0.729 (1.170)	0.228 (1.637)	0.0000787 (3.603)	0.0639	232
Central	0.339 (1.369)	0.430 (6.258)	0.0000384 (3.198)	0.0983	510
East	0.616 (1.736)	0.395 (3.317)	0.0000174 (0.923)	0.0427	244
West	1.139 (1.947)	0.533 (2.929)	0.0000344 (1.50)	0.0507	209
South	0.488 (1.234)	0.675 (5.113)	0.0000507 (3.570)	0.1087	351

D Equation: Hhsi = αi + Ii + Edu_hi					
Dependent Variable	**Independent Variable**				
Household Size (Hhs)	*Constant*	*Income*	*Education of head*	adj-R^2	n
North	1.626 (5.023)	0.000133 (11.715)	-0.013 (0.182)	0.3734	232
Central	4.336 (17.398)	0.0000941 (7.786)	0.076 (1.098)	0.1123	510
East	2.775 (10.280)	0.000138 (9.596)	0.069 (0.766)	0.2792	244
West	2.564 (7.106)	0.000124 (8.772)	-0.256 (2.276)	0.2656	209
South	3.884 (15.875)	0.0000774 (8.779)	-0.235 (2.879)	0.1828	351

In general, we find that despite highly restrictive assumptions, educational level of the head does explain income inequality across households to the extent of almost 20 to 30 percent. This relationship is weak only in the West. While the reason for this is not very clear, the answer may depend on the availability of employment opportunities, including self-employment, that are not based on education. As was seen above, the relationship is much stronger for above poverty line, salaried and urban households than for below poverty line, wage earning and rural households, respectively. The educational level of the young depends to a much greater extent on the educational level of the head than on the income of the household. However, here again the variables explain variations in the educational level of the young to a very small extent in the West and at times even in the South. The reason may lie in a more proactive approach towards education by the state governments in these regions so that supply side variables gain importance. When we come to household size we find the intercept term to have the most significant value, and it turns out to be the highest in the Central region. This term is more likely to be linked to externalities associated with the average educational level of the society and the effect of public policies on child and maternal health which would create a certain attitude towards family size.

VIII. CONCLUSION

We have looked at the two-way inter-linkage between (i) education and income and (ii) health and income. We have also presented the effect of education on health. The introductory Section I revealed the importance placed by the developing countries on

education and the failure of India to keep pace with countries like China and Korea. The results show that India may have lost an opportunity by not replicating the experience of these successful economies.

Education appears to be as much a determinant of income as being determined by income (Section II). Expectedly, the average education and income level is higher in urban areas than in rural areas, a difference that is likely to be due to both internal returns as well as externalities associated with income. The family size in rural areas bears a more complex relationship with income and education, while it declines in urban areas with education. One of the implications is that the average level of education in a community is important in establishing a small family norm.

A comparison of salaried, above poverty line and urban households with wage earning, below poverty line and rural households respectively, suggests that the transformation of higher education into higher income is crucially dependent upon the socio-economic background of the households and the opportunities available to exploit the potential created by education. Depending upon these conditions the attitude towards family size and education of the young is also likely to differ; a greater preference is shown for quantity rather than quality of labour as an asset base of the household by the BPL and wage-earning classes. Another feature that emerges is that while education has a negative effect on family size, income has a positive effect on family size. In order to break out of a low-level equilibrium trap, education may serve as an important instrument by bringing about a decline in preference for a larger family.

When we introduce health indicators the relationships are not smooth, possibly due to the problem of subjectivity in perception of health. For whole of India, rural, APL and salaried households, morbidity and expenditure on health are highest where the head has had 6-8 years or more than 13 years of schooling. It may be conjectured that it is the result of both gaps in perception as well as improvement in health with education. With rise in education above 8 years of schooling the problems perceived at earlier levels may be taken care of by improved living conditions as well as increase in income. Beyond 13 years of schooling there may be a further increase in perception of health problems along with an increase in capacity to undertake higher expenditure on health. An interesting feature is that in urban areas the lower income groups undertake higher expenditure on health. It is likely to be more in the

nature of curative health expenditure rather than preventive health expenditure, the problem being compounded by the polluted and congested living conditions in urban areas apart from the lower perceptual understanding of health problems due to lower educational level. When we add to it the fact that they also show preference for private health providers, it implies that they have a greater stake in maintaining good health and it may have a lot to do with a more informed environment. The figures for child mortality suggest that they are negligible at beyond elementary level of education and are also influenced by general level of education in the society. While the gender bias in child survival is not easy to explain, it seems to be influenced more by 'economic worth' of women at low-income levels and by cultural factors at higher income levels. The problem is most acute for 'middle-educated and middle-income' households. It may also be concluded that more than household expenditure, health may be determined by the level of education, greater public spending particularly towards improving the quality of services and overall socio-cultural environment.

Between health and income the relationship is not very clearly defined. While health does show an improvement for higher income level households, there is no clearly definable trend for the lower income groups. The reverse inter-linkage is even weaker.

The regression results mostly confirm the findings that have been noted above. Despite some highly restrictive assumptions, education does explain inequality in income to quite a large extent. Average years of schooling of the young is also seen to be explained by the educational level of the head and the income of the household. Income, however, is less important than education of the head of the household in explaining years of schooling of the young or the household size. Across regions, the returns to education are highest in the South followed by North. The relationship is weakest in the West, where availability of employment opportunities and self-employment opportunities may be the highest, thus breaking the linkage between education and income. In explaining the educational level of the young, the variables education of the head and income are significant in all the regions but the explanatory power is lowest in the South and the West. A higher level of average education in the society and a more proactive state may be responsible for this. The supply side may be more predominant than the demand side. The household size is also explained to a large extent by the education of the head and the income of the household, but the constant term has the highest value and is in general the most significant. The attitude towards family size may be reflected by the constant term. It is the highest in the Central region which

suggests that a higher average higher educational level, better health facilities and a more proactive public policy in general may have a lot to do in reducing the pressure of population in these regions. In South, contrary to our general result, at times we find a negative effect of income on family size and a positive effect of education of the head of the household. While the reasons are not very clear, this may be linked to migration out of the region in search of employment opportunities.

The externalities associated with education stress the importance of state taking a much more pro-active role in increasing the educational level. It especially needs to concentrate on the problems of below poverty line and wage earning classes. The importance of elementary education has been emphasised again and again in the literature. While it always received highest priority in government expenditure on education, the target was never achieved. The reforms had a negative impact on the expenditure on elementary education by the states, and the recovery was never complete. However, there was no clear link between growth of revenue expenditure and educational outcomes, which may be due to the impact of demand side factors, efficiency of expenditure and rate of growth of population. Public expenditure per child influences the quality of education more than achievement levels. Both public and private expenditure are positively influenced by the average educational level of the state and the state domestic product that reflects both higher income as well as greater economic opportunities. A heartening fact noted was that the laggards in terms of educational achievements are trying to catch up with the best in terms of educational attainment and quality of services by increasing their expenditure on elementary education.

While the micro level data show that education positively influences income and health, the macro level data show that the level of literacy has a positive influence on the level of public spending in education. The level of public spending in turn has a positive effect on retaining children at school and the quality of service provided. The level of private spending is strongly influenced by the state domestic product per capita and to some extent by the level of literacy in the state. Thus what emerges is a strong inter-linkage at the macro and the micro levels reinforcing the role of state in providing elementary education. This, in the view of the authors, is one of the main conclusions of this study.

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Appendix

Sample Size

A
Sample Size based on Education

Education of Head of household (years of schooling)	Number of Households						
	All India	Rural India	Urban India	Below Poverty	Above Poverty	Salaried	Wage Earners
0	1929	1782	147	719	1210	204	1012
1-5	730	618	112	226	504	130	264
6-8	540	412	128	129	411	140	152
9-10	692	365	327	80	612	319	90
11-12	303	109	194	24	279	178	22
>13	662	78	584	19	643	495	6
Total	4856	3364	1492	1197	3659	1466	1546

B
Sample Size based on Income

Annual household Income Group (Rupees)	Number of Households						
	All India	Rural India	Urban India	Below Poverty	Above Poverty	Salaried	Wage Earners
Upto 1800	4	4	-	2	2	-	1
1801-3600	13	13	-	11	2	-	6
3601-7200	110	106	4	68	42	1	54
7201-14000	624	607	17	417	207	22	409
14001-28000	1650	1479	171	549	1101	206	815
28001-56000	1398	867	531	130	1268	622	244
56001-72000	335	122	213	12	323	196	12
72001-96000	318	97	221	5	313	188	3
96001-150000	283	54	229	3	280	168	2
Above 150000	121	15	106	-	121	63	-
Total	4856	3364	1492	1197	3659	1466	1546

C
Sample Size based on Health

Average no. of days members were ill per month per household	Number of Households				
	All India	Rural India	Urban India	Salaried	Wage Earners
0	2913	2087	826	860	2913
1-5	1304	848	456	447	1304
6-10	189	127	62	56	189
11-15	44	28	16	12	44
16-20	26	16	10	6	26
21-25	10	9	1	2	10
>25	370	249	121	83	370
Total	4856	3364	1492	1466	4856